This Issue: Electrical Co-operative Helpfulness and War Service Progress in the West

JOURNAL OF ELECTRICITY

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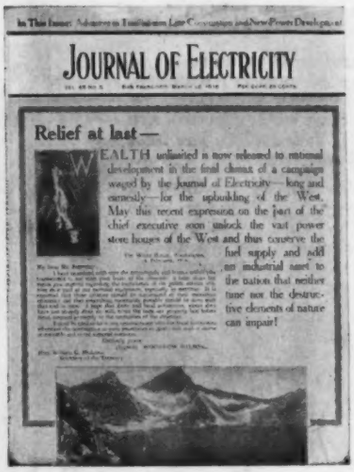
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JOURNAL OF ELECTRICITY

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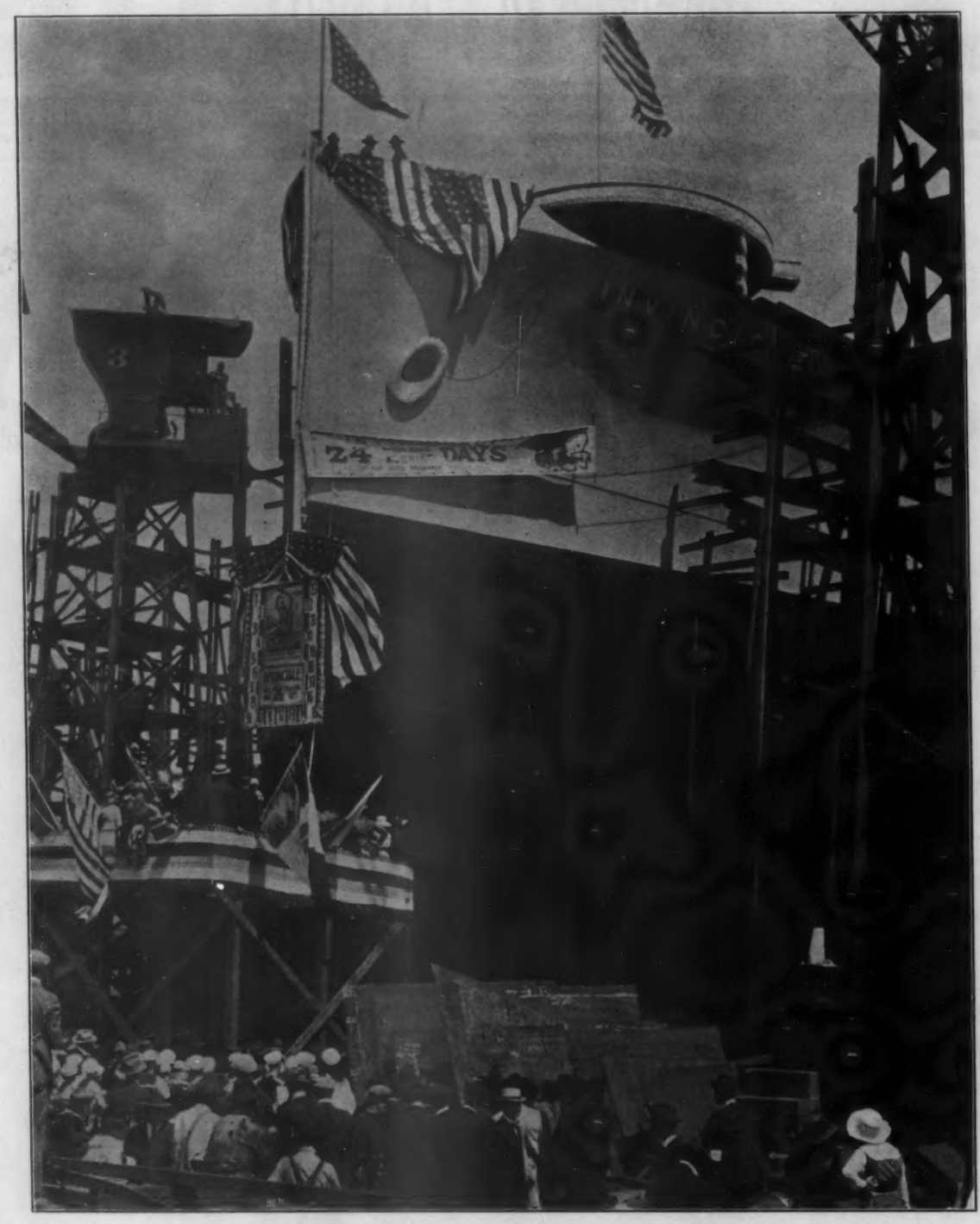

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A NEW WORLD'S RECORD IN SHIP CONSTRUCTION

Electricity is proving the master workman in performing the great world beating achievements in ship building now each day taking place in the West. Nearly twenty thousand horsepower of installed capacity in electric motor drive for a single ship-building plant! This plant which is that of the Bethlehem Shipbuilding Corporation, in the San Francisco Bay district, has within the last few days established another world record. The twelve thousand ton freighter—the Invincible—slipped down the ways August 4, 1918, in 23 days, 11 hours and 40 minutes after the laying of its keel—a feat far outdistancing any similar performance in the annals of the world in ship building.

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JOURNAL OF ELECTRICITY

DEVOTED TO THE UPBUILDING OF THE ELECTRICAL INDUSTRY IN THE WEST AND IN THE COUNTRIES BORDERING THE GREAT PACIFIC

Volume 41 SAN FRANCISCO, AUGUST 15, 1918 Number 4

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Let us show our utter contempt for the things that have made this war hideous among the wars of history by showing how those who love liberty and right and justice and are willing to lay down their lives for them upon foreign fields stand ready also to illustrate to all mankind their loyalty to the things at home which they wish to see established everywhere as a blessing and protection to the peoples who have never known the privileges of liberty and self-government.—Woodrow Wilson.

A Little Straight Talk from the West

Engineers of the West have followed with unusual interest the proposed forming of a comprehensive united organization for the engineering profession in America. Unquestionably any broad workable plan that will do away with duplication of effort among the several national engineering societies will meet with the enthusiastic approval of every engineer in the West.

It has, however, proven a painful thorn in the side of practically every engineer in the West during recent months to note that officials of the various national engineering societies in New York City have been so wholly oblivious to Western needs both in the angle at which national problems have been investigated and in the lack of appreciation of the difficulties under which the extremely Western sections and branches have struggled for existence with little or no financial or moral support. This situation is too well illustrated in the recent procedure of one of the national conventions in which the fuel discussion took a major portion of time with no mention of fuel oil and the problem of hydroelectric development now so seriously affecting the very industrial heart throbs of the great West.

No one indicts the motives of engineers of the East for this apparent oversight, but it is attributed to our wholly different life and environment and the conditions of engineering practice that must be altered to meet our peculiar problems west of the Rockies.

Hence it is, that thoughtful men in the various engineering societies west of the Rockies are considering the proposal of an immediate plan of action somewhat as follows:

That each large center such as Los Angeles, San Francisco, Portland, Seattle, Spokane and Salt Lake City, be urged to form an engineers' club, if such be not already in existence. That the secretary of this club, who probably will be paid for his services, be appointed as an assistant secretary by each of the National engineering society branches represented in the locality. That a group of discussions on war service problems be arranged to be discussed either jointly or in different sessions of the local sections of the five national engineering societies simultaneously throughout the West during successive monthly or quarterly intervals of the year. For instance, water power would be attacked by the chemists perhaps from the viewpoint of electrochemical war necessities and development, and similarly by the civil engineers, the mechanical engineers and the electrical engineers from their own particular viewpoint.

In order that these successive war discussions may proceed with the vigor and life desired, it is proposed to have a Western managerial head whose duty it will be to assist in every way possible to forward in all districts of the West this most necessary and helpful war service.

This program will of course involve the expenditure of money. Extremely unfavorable comment is being heard from many quarters of the West over the very small returns of dues paid in, that have in the past been sent West to keep alive in such remote districts as ours from the New York center, the very morale that is so necessary for wholesome development.

The attitude of financial helpfulness on the part of the national engineering societies will be watched with extreme interest in all quarters of the West as these plans for the coming year solidify within the next few weeks.

A Shut Down of Service Intolerable

It is hard to conceive of anything more necessary as a war essential than the continuity of service in the supply of electric power. The building of ships, the manufacture of munitions, the transportation of troops and supplies—in fact practicaly every phase of civil and military life of the nation is concerned in some way or other in the uninterrupted supply of electric power. Indeed, considered from some viewpoints its importance exceeds that of uninterrupted service in the railroads and in the telegraph and telephone systems. There are other means—the swift automobile, the carrier pigeon, the aeroplane—that can be

used temporarily to transport troops and commodities and to convey intelligence in emergencies, but we challenge any one to suggest how the great wheels of industry may be made to turn on short notice without the subtle supply of electric power needed to energize the activities of our great industrial centers.

Recently there has taken place in one of the Canadian provinces to the north, described in full elsewhere in this issue, a shut down in electrical supply that may well shock the sensibilities of every loyal citizen of that country, and in the ship yards of the San Francisco Bay district, a shut down of three days during July similarly makes every loyal American citizen protest the tolerance of such conditions.

This country has now sent abroad almost a million and a half of its cleanest, brightest and most desirable citizens. They have cheerfully gone at the call of duty. Indeed it is questionable whether ever before in the history of the world a universal drafting of citizens has taken place so willingly and so loyally. These men for the most part receive but thirty dollars a month and go prepared to give their lives should the occasion demand it.

That an interruption at home in war essentials can for a moment be tolerated is inconceivable in the mind of the loyal citizen. It is believed that in the rank and file of the men engaged in this work similar ideals prevail. Should such occasion arise again there is but one straightforward course to pursue in justice to our boys at the front and that is to draft into national service not only the industrial workers but, if necessary, every man, woman and child in the nation, in order to see to it that the enemy does not enter into our work at home to interrupt activities upon which the very life of the nation depends.

The Butte-Seattle-Portland-San Diego Tie-in

The increasing shortage of power in Central California has naturally led to speculation as to where some available surplus power may be acquired. The description of the Copco plant of the California-Oregon Power Company appearing elsewhere in this issue will enlighten the reader on some phases of this interesting problem as it presents itself in California. The power from this installation, which is located in the extreme northern section of California, would prove uneconomical to transmit to San Francisco at the prevailing voltage of 60,000 volts were it not for the fact that the Northern California Power Company at present transmits a large share of its output toward the north. By means of the new interconnection with the California-Oregon Power Company, this load in the future will be carried by the latter company, making it possible for the Northern California Power Company to deliver some 9000 kw. to the Pacific Gas & Electric Company still farther to the south and thus help to solve the power shortage now prevailing in the great industrial centers of Central California.

It is an open secret, however, that even this power supply will not be sufficient to meet the constantly increasing demands. A search on farther to the north finds a similar power shortage prevailing. It has long been known, nevertheless, that in the vicinity of Spokane the great Longlake Plant of the Washington Water Power Company has been comparatively lightly loaded.

Due to the completion of recent interconnecions in the northwest between the Pacific Power & Light Company and the Washington Water Power Company on the eastern end and the Pacific Power & Light Company and the Northwestern Electric Company along the western reaches of the Columbia there remains but a small gap of unconstructed line in a complete tie-in with Harlowton, Montana, east of Great Falls, and a stretch of lines many miles to the south of Portland. Indeed on down to the Mexican border south of San Diego, California, but a total of four small gaps exist over a 2000 mile stretch of the world's greatest transmission systems.

While as yet economical transmission of power is about reached with the Copco connection in California and the San Francisco district, thus precluding any possibility of power supply further north, still it is quite clear to the thinking mind that the day is not far distant when vast trunk lines of 200,000 volts and over will connect up this Western territory, so prolific in water power resources, and thus make possible an interconnected service that will build an empire for all posterity. Such a system of trunk lines would make possible the development of the Dalles, the Priest Falls, the Pit River, the Feather River, and the Big Creek developments and add to our present developed water power resources in one fell stroke almost two million horsepower. And the interconnecting trunk lines would afford ideal opportunities for interconnecting an additional four or five million horsepower in minor developments that otherwise would be commercially impossible. Such a gigantic scheme of interconnection is well worth the thoughtful study of big men earnest in their desire to be of service to the nation in the present power crisis.

Is Gold Mining an Essential?

Recent orders for conservation of electric power forbid the use of electric signs and electric energy on certain evenings and limit the supply of power to breweries by 50%. There has been much discussion in the West as to how far down the list it will be necessary to go before the gold mining industry is to be limited in power supply. It is argued by some that since the basis of our money standards is gold, the development of this mineral resource should be considered an essential of the first order.

To every thinking person it must appear, however, that as long as human sinew and brawn remain intact and the production of munitions and weapons of war are unhampered in manufacture that the fight for democracy will go on irrespective of the mere material basis of value that the standard of money may demand.

In view of this fact the curtailing of the gold producing industries of California and other districts of the West, should occasion arise, would not in the last analysis prove an insurmountable difficulty in

proceeding with the fight for the liberties of free people. Indeed, in California the quartz mining industry has been in such a precarious condition for several years past that many are prone to believe that the liberation of great blocks of power by curtailing the supply to the quartz mines would prove a god-send, should the occasion arise—to carry the West safely through a real power shortage.

Letting the Public Know

A recent editorial in a British contemporary comments inquiringly on the "sane policy of informing the public" which was one of the recommendations of the recent Del Monte conventions. With very real respect for the practical democracy of our great ally this query is nevertheless an interesting comment on the difference in our forms of government. One of the elements of the democratic form of organization as practiced in America—one which we are just beginning to comprehend—is the necessity of educating the public to believe in the justice of any cause if it is to prevail. This is well recognized in the advertising of the war—and indeed, it is a conspicuous difference between our allies and the central empires and a testimony to the real spirit of democracy on our side that an explanation, a justification and a complete laying of the cards on the table has accompanied every step.

This same principle is seen to be active even in less public concerns. It does not have to be a question on which the public votes, nor one to be passed upon directly by the elected representatives of the people—it may be more or less of a private matter conducted on strictly legal lines—but if the public conceives it to be inimical, that matter will sooner or later have to fight for its existence. And its only effective weapon in that fight, its only possible hope for success, will be the education of the public as to its essential justice.

The privately owned public utilities today face the necessity of asking for increased rates (and it is not altogether a question of whether the rate fixing bodies can be persuaded to grant them, but whether the public will stand them when granted) and they face in the not far distant future a possibility of government ownership in response to public demand. The blame for both problems is rightly to be laid at the door of the hazy opinion which the 'average public' holds that a corporation means a few rich men out for gain, with no interest in the welfare of the community.

As a matter of fact, the public utility today is probably in advance of the public in its conception of public service and cooperative helpfulness. This should not be credited wholly to altruism, for its virtues have been forced upon it in measure by the demonstrated fact that only broadest service and cooperation pay. The important point is that it has developed to these virtuous heights in comparative silence, and it is just awakening to the need for a "sane policy of informing the public."

One of our western central stations recently applying for an increase in rates, preceded the plea by an extensive publicity broadside, educating the public as to their essential service. The "PUP" (Public Utility Problems) advertisements, although perhaps the best known, are only one of a great series of educative campaigns being conducted by street railway and power companies. Perhaps the policy of customer ownership which is in essence an educative measure, is the most effective means of all in acquainting the public with the nature of its public servants.

All this, while perhaps inconvenient, is good business policy and incidentally, elemental democracy.

The 1918 National Electrical Code

The new regulations for the National Board of Fire Underwriters are now being distributed throughout the West. Many new changes are listed and a careful perusal of this valuable work is of great timely importance to all interested in the subject of electric wiring and apparatus.

Attention is especially called to Rule 26a. This paragraph states that the neutral conductor on all three-wire circuits and one conductor on all two-wire circuits must have an identifying insulating covering and that this wire must be run without transposition throughout the entire installation and properly connected at all fittings to identified terminals. Although this new series of regulations has just made its appearance to the trade, yet for war service reasons this rule since its recent issuance has been suspended indefinitely.

There are other matters of great timely importance that conflict with the carrying out of similar regulations in various municipalities in addition to the rulings set forth in the 1918 Code.

Thus, owing to the condition of the steel industry in the United States, it is necessary that every ounce of steel be conserved for war purposes. One way that this may be accomplished is to use porcelain in knobs, tubes and cleats instead of iron conduit or steel flexible conduit and in fact in any article which has a free abundance of steel in its construction.

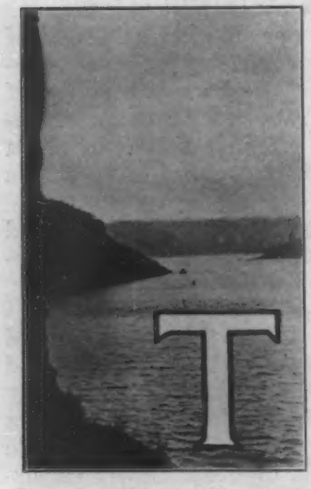
The fostering of such substitutes has been initiated by the Government and sanctioned by the National Board of Fire Underwriters. Attention is called to the matter in greater detail elsewhere in this issue. The entire subject is of great timely importance and deserves careful consideration throughout the various municipalities of the West.

THE NEW JOURNAL SERVICE: Beginning with its issue of October 1, 1918, the Journal of Electricity will again take a step forward in progressive editorial policy. Many new departmental ideas will be introduced, announcement of which will be made in our next issue. The issue of the Journal of Electricity for Sept. 1, 1918 will feature interesting hydroelectric developments in Tasmania and timely authentic data on the commercial and engineering development of Siberia. The issue of September 15, 1918 will feature the splendid papers and accomplishments of the Northwest Electric Light & Power Association and will be devoted to this subject as a convention issue.

THE NEW COPCO DEVELOPMENT

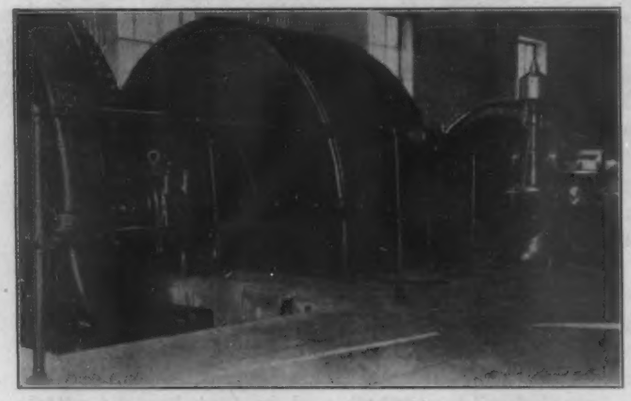
BY C. B. MERRICK

(The new Copco plant makes available a source of power for use in the Northwest — thus releasing the power from that region to be transmitted to the San Francisco bay district. Interesting features of construction and operation as well as its importance in the interconnection now being put through at Castella make the details of this plant worthy of study. —The Editor.)



The perpendicular walls of the canyon which impound the water supply.

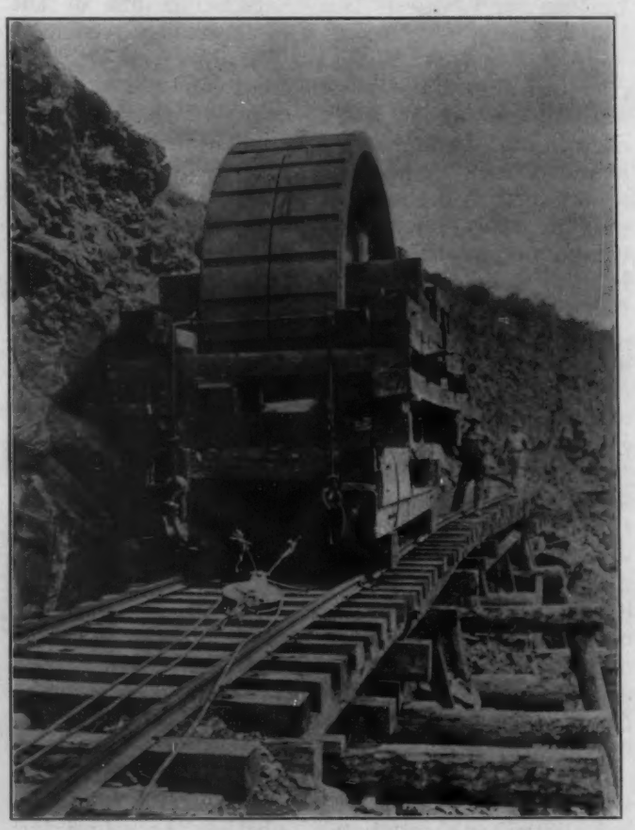
THE wonderful services of electrical energy in the conservation of resources for humanity have been increased by another step, with the completion of the hydro-electric plant at Copco, California. The fertile Shasta valley, which is being brought under irrigation by means of electrical pumping, will be further supplied by this plant which was put in operation in February. With the completion of a 95 mile transmission line, proposed as a war emergency tie-in between the California-Oregon Power Company at Castella and the Northern California Power Company at Kennett and a resultant shifting of load, the 12,000 kva capacity of this plant will in effect be available at a distance of 230



Two of the three generating units in the Fall Creek Plant

miles with a line loss of only 16-18%. This loss is slight when consideration is made of the 60 kv. transmission voltage. The shifting of load from the Northern California Power Company to the lines of the California-Oregon Power Company relieves the generating capacity of the first company so that it in turn can pick up load from the Pacific Gas & Electric Company at Colusa Corners.

This new unit of the California-Oregon Power Company, on the Klamath river in northern California, is ideally located with reference to the rest of the system. At the geographical center of the company's lines, with lines radiating to the Klamath, the Rogue river and the Siskiyou Divisions, it relieves the deficiency of power to the south of the Siskiyou Range. Up to this time the Siskiyou District had been dependent upon the transmission system over the divide from Medford for power during the peak load. The installation of the first turbine at Copco brings the generator capacity above the



The forty-two ton rotor for the new Copco Plant being lowered on the zig-zag for installation below.

peak load demand, so that the transmission line over the range is now used for standby service. This network of lines is unique in that it is supplied entirely by hydro-electric installations, no steam plants being in any way connected with it. Each branch of the system has a small plant of its own near the center of distribution, which is augmented by power from the large central plants.

Situated just two miles from the Fall Creek plant, built in 1903 and the first of the many now operating in parallel, Copco presents many contrasts with its predecessor, as shown by the following table.

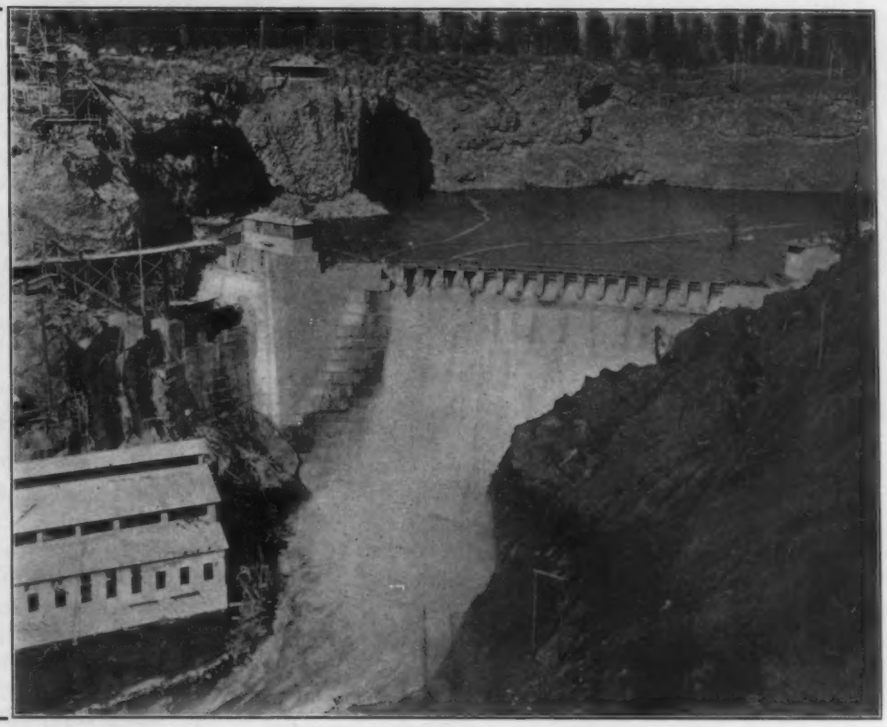
COMPARATIVE FIGURES, COPCO AND FALL CREEK PLANTS

Plant	Power Source.	Capacity.	Ultimate Head in ft.
Copco	Allis-Chalmers Turbine	18,600 h.p.	125
	" " "	1000 h.p.	730
Fall Creek	Pelton Water Wheel	500 h.p.	730
	" " "	1250 h.p.	730

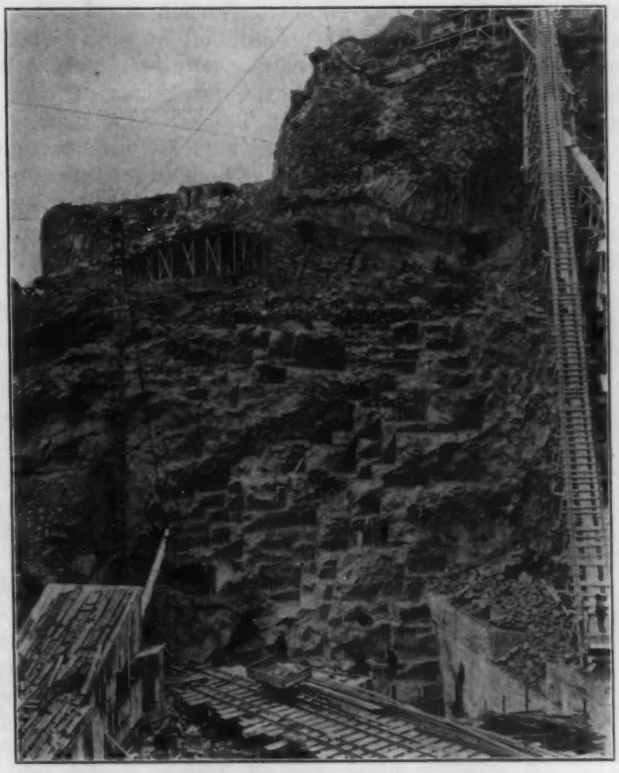
The turbine (Fig. 2) is of the low head type, rated at 18,600 h.p. The double wheel is supplied by two 10-foot penstocks, and discharges through a

THE COPCO DAM AND POWER HOUSE

This striking new engineering feat in dam construction has recently been completed in northern California for the California-Oregon Power Company. The power from this source will be of constant supply throughout the year and the new interconnections now under way will soon make this timely energy in the far north available in the great industrial centers of the San Francisco bay district. The breadth of interconnected network involved shatters all previous world records in the history of electrical engineering.



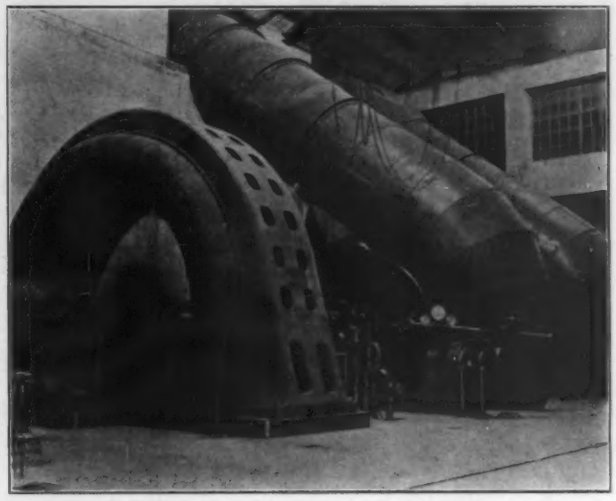
center outlet between the wheels. The comparatively slow speed of 200 r.p.m. necessitated an immense machine for the 12,000 kva. generator, the rotor alone weighing 85,000 lbs. A fair idea of the



West niches made in the side walls during the construction of the dam as they appeared in March, 1917

size of this apparatus can be obtained from the accompanying views. To transport these heavy pieces down the nearly perpendicular walls of the canyon necessitated the building of a zigzag railroad with a maximum grade of 10%. Two 200 kw. exciters are operated by small individual turbines. Generation of power is at 2300 volts, two banks of transformers stepping up to 34,000 Delta and 60,000 Y for transmission. Eventually it is planned to make all the lines 60 kv.

The power house is located at the foot of the dam, the penstocks leading directly from the top of the dam to the turbine. The height of water above the penstock gates is at present only 12 feet, but



Interior view showing the generator and the penstock piping

this will be increased by about 15 feet upon the completion of the development, the plans for which call for another unit of the same size as the present one. Comparatively little storage is required, due to the exceedingly uniform stream flow, as indicated by the accompanying table:

WATER FLOW OF KLAMATH RIVER

	(Since 1910) Actual.	Average.
Min.	1200 sec. ft.	1500 sec. ft.
Max.	6900 sec. ft.	4500 sec. ft.

However, the storage available will amount to at least 5000 acre feet, the vast expanse of the lake stretching up the canyon for five miles.

A novel feature of the development is the fact that forebay and flume were unnecessary, the full capacity of the storage being thus available for immediate use. Additional power can be obtained by a diversion dam immediately below the present structure and a flume three miles in length which will give an equivalent head for another installation.

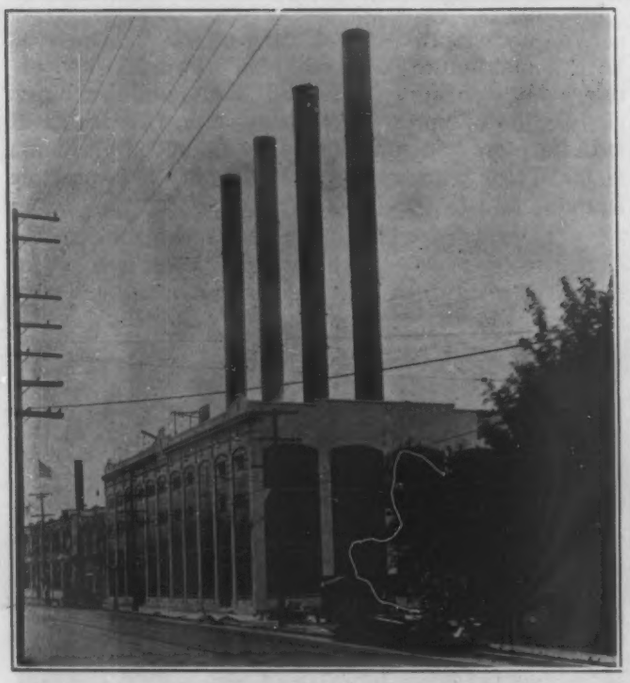
The dam of reenforced concrete extends as far below the level of the former river bed as above, the foundations being sunk 125 ft. to bed rock. At a depth of 80 ft. the excavations unearthed a huge mastodon skull measuring 3 ft. 5 in. across, which has been presented to the museum at Berkeley.

AUXILIARY STEAM PLANT FOR SEATTLE

BY JOHN H. LONGFELLOW

(Fuel oil operation with provision for change over to a coal fired system constitutes an interesting feature of the new auxiliary steam power plant for the city of Seattle. Though but recently completed and placed in commission this interesting new 10,000 kw. installation is already heavily taxed in generating output.—The Editor.)

What is known as the Lake Union Steam Plant was recently completed for the city of Seattle. The first unit of this plant was completed in 1914 and is of 10,000 kw. capacity. The second unit is practically a duplicate of the first. The contract for construction was awarded in May, 1917 and the first run made on April 25, 1918. Considering the fact of the war and the difficulties encountered in procuring equipment, a remarkable record was made by those supplying and installing the machinery and by the Lighting Department of the city which had charge of constructing the building and the installation of the switchboard and electrical equipment.



The exterior of the steam plant at Eastlake and Nelson Place. The plant was taxed to the limit of its capacity before it had been in service a month.

An Oil Burning Equipment—

The boilers in the new addition consist of four Stirling Class M-30 boilers, arranged in banks of two, each boiler having 8226 square pounds working pressure and each boiler provided with a Foster superheater, designed to superheat the steam to 125 degrees Fahrenheit. The four new boilers are duplicates of the four in the first installation with the exception that the older ones are designed for 200 pounds working pressure instead of 250 pounds. The boilers are set high to provide for a change to stokers. They are now provided with Peabody oil furnaces, each equipped with three burners capable of operating the boiler at 200 per cent rating. The manufacturers guarantee the boilers for continuous operation at 180 per cent rating without injury to the boiler heating surfaces. The net guaranteed efficiency of the boilers is 77 per cent, when operated at rated load, and it is possible to approximate this value under operating conditions when the heating surfaces are kept clean. Diamond Specialty soot blowers are installed in the four new boilers to accomplish this purpose with the least loss of time and expense.

Each boiler is equipped with "S-C" feed water regulators. Each battery of two boilers is connected by a double breeching with an Armco iron stack ninety inches in diameter and approximately 150 feet high above the boiler room floor.

The turbo-generator room. All steam pipes are placed below the main floor in order not to interfere with the 25 ton crane which travels the length of the building.

Installation Details—

The boilers are protected by Lagonda non-return stop valves and are connected with the main steam header in the basement by means of seven-inch, long radius bends and Venturi type gate valves. The twelve-inch main steam boiler runs the full length of the basement, below and back of the boilers. The sections composing the old and new units are connected through long radius compound bends and a Venturi type gate valve. The eight-inch auxiliary steam header parallels the main steam header to which it is connected by means of return bends. Both headers are one-half inch thick, as are all other straight pipes larger than seven inches in diameter. Extra heavy three inch blow-off lines lead from each boiler to the outside of the building.

Delivery of Fuel Oil—

Fuel oil is delivered at the plant in barges towed into Lake Union from Puget Sound through the government canal. The oil is pumped from the barges into two 15,000 gallon, horizontal steel tanks on the lot next to the original steam plant building, by means of duplicate inside packed, double acting eight inch by ten inch, 30 r.p.m. fuel oil pumps, direct connected by means of gears to ten horsepower, variable speed, 125 volt direct current motors. One 7,200 gallon service tank is placed above the storage tanks and the suction pipes from the burner pumps run through the dome and down to the bottom of the tank, terminating in a foot valve. The tank is separated into two halves by a partition, thus making in effect two tanks. This fuel oil storage equipment was installed with the first unit of the plant.

The Main Generator—

The main steam turbo-generator is of 10,000 kw. capacity with 12,500 kw. as a maximum capacity. The governor is operated by an oil relay. The turbine is connected to the main steam header through long radius bends, 12 inches in diameter, Venturi type valve and steam separator, all placed below the main floor with no steam pipes exposed in the turbine room to interfere with the operation of the 25-ton Whiting crane which travels the entire length of the building. The turbine and generator set has two bearings, with their shafts connected by means of a flexible coupling. Bearings are supplied with oil at about two pounds pressure and the oil is circulated through cooling coils by means of a gear-driven rotary pump. A Richardson-Phoenix oil filtering system is installed in the basement below the turbine.

The generator is of compact, symmetrical design, with end bells to provide for forced ventilation. Air is drawn from under the building and discharged to the roof through an air shaft built in the dividing wall between the turbine and boiler rooms. The generator has an inherent reactance of twenty per cent, which makes it unnecessary to provide current limiting reactance coils as was done in the case of the first machine, which had an inherent reactance of only ten per cent. In this case the coils having five per cent reactance, were placed in the pit below the generator.

The exciter generator is a fifty kilowatt, 125 volt machine and is direct connected through a flexible coupling with the 2400 r.p.m. horizontal type impulse turbine.

Exhaust steam from the turbine passes down through the corrugated copper expansion joint and a special tee, which connects with a relief valve and 36-inch atmospheric exhaust pipe, directly into the condenser which is of the rectangular low level

Boiler room of the Seattle steam electric plant. Boilers are set high in order to permit of changing the plant from oil to coal burning if so desired at a later date.

jet type, made by the Wheeler Condenser & Engineering Company. It is equipped with a rotary air pump and double discharge pump having a combined motor and turbine drive. The speed is 1800 r.p.m.

Direct Connected—

All apparatus is direct connected through flexible couplings and mounted on a common bed plate with the condenser, no gears being used. The condenser is designed to produce a 28.5 inch vacuum referred to a 30-inch barometer, when condensing 150,000 pounds of steam per hour, and the vacuum is reduced to 27.5 inches when condensing 200,000 pounds of steam per hour under extreme overload conditions. By dividing the load between the turbine and motor driving the condenser, it is possible to provide the required amount of exhaust steam for heating the feed water, without allowing any to discharge to the atmosphere.

Boilers, superheaters, feed water heaters, motor driven boiler feed pumps, service pump, fuel oil pumps for burners, piping and condensing equipment were supplied and installed by Charles C. Moore & Company. The main turbo-generator, turbo-exciter and oil filtering system were supplied and installed by the Allis-Chalmers Manufacturing Company.

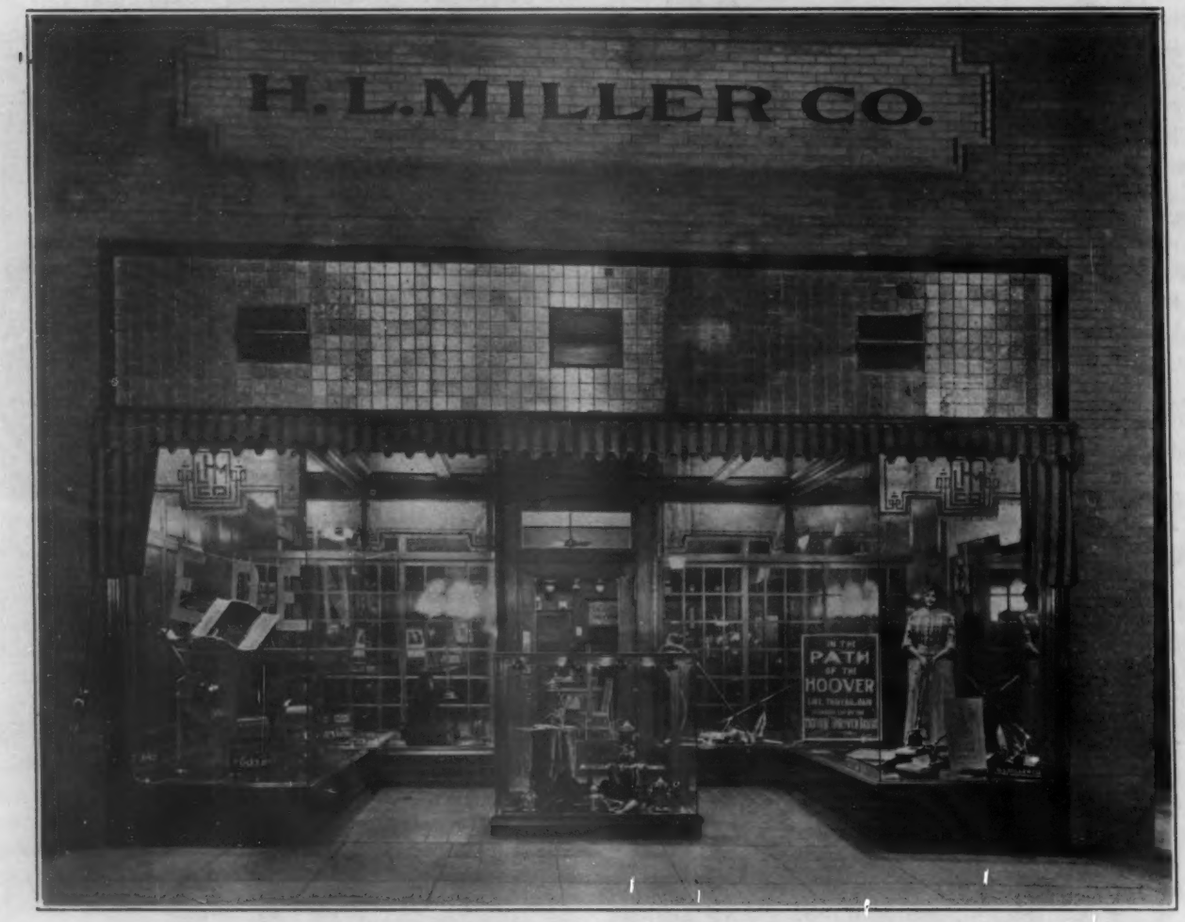
Capacity Already Overtaxed—

Although the second unit was but recently completed and placed in commission, it is already being heavily taxed. The water at the Cedar Lake plant of the city is so low that the Lake Union plant is supplying the chief power demands of the city. The lighting department is investigating the question of installing a third unit which may be placed on Lake Union or at one of the coal mines along the high tension line on Cedar river. Demands for power are so great that many applicants are being turned away.

THE SELLING POWER OF THE STORE FRONT

BY A. L. SPRING

(The importance of the store window as a silent salesman emphasized by the Southern California representative of the California Electrical Cooperative Campaign—A case in which good is made better with direct results of benefit to the dealer.—The Editor.)



THE NEW STORE FRONT

Note the special display case for feature campaigns. The name of the company does not disfigure the glass but is shown on a distinctive sign placed on the floor of the window. The curtain which borders the window above features Mr. Miller's monogram.

THE PUBLIC JUDGES a merchant to a considerable extent by his store front and show windows. To realize that this is the case and that it is appreciated by many merchants in all lines of business, one has but to notice the numerous cases where old store fronts and show windows are torn out and more expensive new ones installed. Years of experience have taught these merchants the extreme importance of attractive store fronts and they know that the expenditures are justifiable and are good investments. But far too few of the merchants who make these changes are in the retail electrical business, yet there is no reason why the fronts of electrical stores should not be up to date and as attractive as those of any stores in any line of business. It would be very pleasing to the California Electrical Cooperative Campaign if dealers would fully realize the importance of their store fronts and when advisable make improvements in them.

ONE OF THE DEALERS in Southern California, L. H. Miller Company, of Pasadena, appreciates the value of an attractive store front, and has just installed an entire new front at a cost of thirty-four hundred dollars, although the front that it replaced was better than the average. The change which the improvement has made is shown in the accompanying illustration, and the new front is an excellent example of how attractive the front of an electrical store can be made.

THE STORE IS ON THE CORNER and there is glass on all sides of the show windows but one, and they are arranged so that appliances are most effectively shown. The woodwork and the floors of the show windows are quarter sawed oak elegantly finished. The floor and base of the entrance are of brown tile and prism glass is used above the show windows. The back of the show windows are paneled glass keeping out the dust, separating sufficiently the show windows from the store and yet not cutting off the light. You will notice that instead of detracting from the window displays by having the firm's name on the glass it is on a small distinctive

THE OLD WINDOW

A model of its kind and yet greatly inferior to the new store front as shown on the opposite page. The actual surface of window front is much smaller, the special show case feature is absent and the whole lacks the distinction of the new finish and artistic detail.

sign placed on the floor of the show window.

A BEAUTIFUL SHOW CASE with plate glass on all sides and on top occupies the center of the entrance. This case is used for feature displays; when a special drive is made on a certain appliance, it is attractively displayed in this case. The case is wired with two floor plugs, one inside and one outside, in series so that when desired the appliance shown in the case can be operated by the customer from the outside. The show windows and the show case are excellently illuminated as shown by the photo, which was taken at night.

PARTICULAR ATTENTION TO SHOW WINDOWS is one of Mr. Miller's principles and he hires a professional window trimmer to dress them. The new store front, with its attractive displays, has made a very desirable impression on the public who are constantly remarking favorably upon it. There should be more store fronts of this high class in the retail branch of our industry and the field representatives of the Cooperative Campaign are ready and anxious to assist any of the dealers who are considering making such improvements.

Shots at Sundry Targets

BY S. M. KENNEDY

The company car is an advertisement in any case—but it may serve to advertise a lax and slovenly organization if it is not properly kept up. The importance of these "moving billboards" should not be neglected by any merchant—more particularly not by the dealer in electrical goods, from appliances to current. The author speaks from his position as general agent with the Southern California Edison Company.—The Editor.)

THE CAR

The number of automobiles which the average public utility company has in use is almost startling. Not counting rented cars and motor cycles, there are 362 automobiles running around this southland bearing the Edison Company's name, for instance. One cannot drive in any direction inside or outside Los Angeles without encountering several machines rushing here and there on company business. Now, there is a tremendous advertising possibility in all this rolling stock, for cars, like men and offices, create impressions which are either favorable or unfavorable. Through the Superintendent of Transportation the company allots certain cars to each district, and the district agent is expected to see they are properly maintained. Once more, put yourself in the position of customer and stockholder, and what kind of impression do you get if you see machines on which are emblazoned the Edison name and catch some of these defects as they whiz by:—

What sort of impression would these make:

Passenger cars with holes where the windows ought to be;
Dusty faded tops;
Dirty spotted fenders and unwashed wheels;
Torn seats and twisted wind shields;
Trucks and trouble cars with mud bespattered bodies;
Tools, ropes and appliances piled on trucks in a disorderly manner;
Tools or appliances dangling on the outside, rubbing the varnish and defacing the car;
Dust and oil on exhibition where they should not be visible.

I can hear some agent saying, "Oh, I've been after the transportation department for a long time to have them bring that car in for repairs." Well, maybe you have. Maybe your men did not take reasonably good care of it and it has degenerated sooner than it should have done. Maybe you have not called for help hard enough, so that you could really be heard. You know "The wheel that squeaks the loudest is the one that gets the most grease," and the agent who persistently makes a reasonable request is the one that will surely get attention.

The automobile fleet has wonderful opportunities for good advertising. Well equipped, clean, carefully loaded, smooth-running cars make a satisfactory, prosperous impression. Even the apparently uninterested observer likes to watch this class of machine and involuntarily looks for the name of the owner. A well kept car spells success, and after all nothing succeeds like success.

HOW ADVERTISING INFLUENCES WOMEN BUYERS

(The results of an investigation conducted along practical lines—of just what type of advertising appeals to women buyers. A suggestion of what might be done among your own customers as well as an illuminating record of what women like as testified to by themselves. The survey is is one carried out by the Women's Advertising Club of Los Angeles and dedicated to the advertising profession with the hope that it may help to greater success in advertising.—The Editor.)

Realizing the important fact that ninety per cent of the nation's shopping is done by women and that millions of dollars are squandered every year in a vain effort to gain their attention, the Women's Advertising Club of Los Angeles launched, in the spring of 1917 (and completed early in 1918) an educational and cooperative campaign.

The object of this movement was to appeal, as women to women, in an endeavor to create greater knowledge among women concerning advertising generally and through understanding, larger confidence and warmer interest; to educate women to a better appreciation of this important factor in the every-day existence of themselves and their families and to ascertain from them, **directly**, just what policies, styles and mediums of advertising appeal to them most.

In promoting this educational work, it is hoped that the results will prove an invaluable guide to advertisers and also tend to elevate the standards and ideals of advertising.

How the Campaign was Conducted

It was decided the best and most direct method of reaching women was through their own channels—clubs, parent-teachers' auxiliaries and similar organizations.

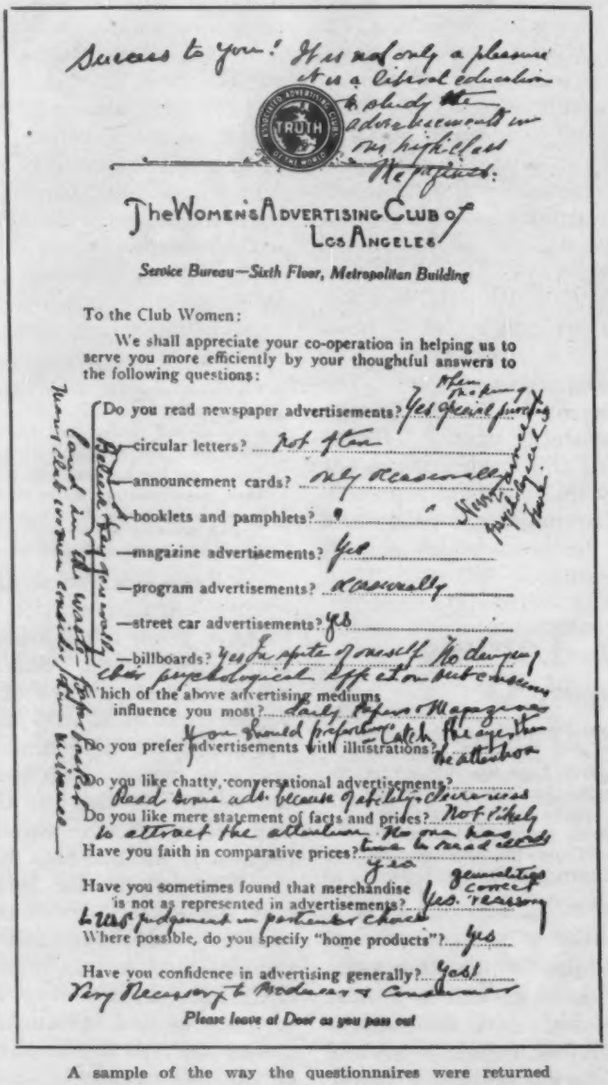
Accordingly, speakers from the Women's Advertising Club appeared on the program of these various meetings. The aims and objects of the campaign were fully explained and a concise questionnaire containing in all, sixteen questions was handed to each woman present.

The speaker always urged that each of these questions be considered thoughtfully and answered, in the space provided, carefully and honestly. The questionnaires were collected immediately after adjournment.

It must be agreed, that information secured by questionnaires distributed directly, as were these, is of far greater value than that resulting from requests for opinions sent out promiscously by mail, as has been done. By the direct method, it is possible not only to determine the classes of persons reached but also to be assured that each questionnaire is answered by the individual without any coercion or influence of others.

Many assemblies of women were reached in this manner, and so much interest evinced, that clubs from adjacent towns asked for speakers on the subject.

An extremely gratifying feature was the fact that women frequently asked questions during the meetings and waited at their close to find out more about the "inside details" of the advertising profession.



Success to you! It was not only a pleasure but a liberal education to study the advertisements in my high class magazines.

The Women's Advertising Club of Los Angeles

Service Bureau—Sixth Floor, Metropolitan Building

To the Club Women:

We shall appreciate your co-operation in helping us to serve you more efficiently by your thoughtful answers to the following questions:

Do you read newspaper advertisements? Yes, general finding
—circular letters? Not often
—announcement cards? Only occasionally
—booklets and pamphlets? Newspaper preferred
—magazine advertisements? Yes
—program advertisements? Occasionally
—street car advertisements? Yes
—billboards? Yes, in spite of myself. No doubt of their psychological effect on subconscious
Which of the above advertising mediums influence you most? Daily Papers & Magazines
Do you prefer advertisements with illustrations? You should preferably. Catch the eye first then attention
Do you like chatty, conversational advertisements? Read some ads. because of catchy characteristics
Do you like mere statement of facts and prices? Not likely to attract the attention. No one has time to read ads
Have you faith in comparative prices? Yes
Have you sometimes found that merchandise is not as represented in advertisements? Yes. Generalities convict reasoning
Where possible, do you specify "home products"? Yes
Have you confidence in advertising generally? Yes!

Very necessary to moderate & conscientious judgement in particular choice

Please leave at Door as you pass out

A sample of the way the questionnaires were returned

Greatest surprise was expressed by many, when they were acquainted with the measures adopted for their protection by numerous high class publications in refusing to accept any advertisement, until its merits and truthfulness had been thoroughly investigated.

Classes of Women Reached

To get a fair average, all classes of women were appealed to from the wealthy club woman and head of a household to the salaried woman and wage earner in modest circumstances.

So diverse were the classes of women covered—embracing as they did, teachers, housewives, workers in factories, stores and offices, professional women and club supporters that it was deemed advisable to figure the results on a basis of one thousand returns. This was believed to be the only consistent manner of treating the problem. Consequently, the thousand questionnaires from which the final statistics were deducted,

represent, as nearly as possible, an equal number of women from various walks of life. This fact makes these returns particularly valuable and authentic, as they thus represent the expression of the average buyer.

Comments by Women

It is interesting to note the many comments that were written on the questionnaires in addition to the decisive "Yes" and "No."

A few of the comments are cited below, just to give an idea of the keen interest manifested in this campaign, and the care with which the questiones were answered. Scores of comments either identical or similar to these were made, proving the thought behind each return.

RESULTS OBTAINED THROUGH QUESTIONNAIRE

On a Basis of 1,000	Yes	No	Occasionally Seldom	Did Not Answer
1. Do you read newspaper advertisements?	83%	6%	8%	3%
2. —circular letters?	33%	40%	15%	12%
3. —announcement cards?	64%	17%	9%	10%
4. —booklets and pamphlets?	32%	35%	16%	17%
5. —magazine advertisements?	72%	10%	12%	6%
6. —program advertisements?	65%	14%	10%	11%
7. —street car advertisements?	75%	11%	7%	7%
8. —billboards?	54%	28%	8%	10%

9. Which of the above advertising mediums interest you most?

—Newspapers?	36%
—circular letters?	1%
—announcement cards?	4%
—booklets and pamphlets?	1.7%
—magazine advertisements?	22.7%
—program advertisements?	3%
—street car advertisements?	4.2%
—billboards?	4.4%
—did not answer—could not decide	23%

On a Basis of 1,000	Yes	No	Occasionally Seldom	Did Not Answer
10. Do you prefer advertisements with illustrations?	64%	16%	5%	15%
11. Do you like chatty, conversational advertisements?	34%	41%	4%	21%
12. Do you like mere statement of facts and prices?	60%	20%	5%	15%
13. Have you faith in comparative prices?	35%	30%	10%	25%
14. Have you sometimes found that merchandise is not as represented in advertisements?	78%	8%		14%
15. *Where possible, do you specify "home products"?	42%	21%	6%	31%
16. Have you confidence in advertising generally?	73%	10%	7%	10%

*Note: This question was asked for the direct purpose of securing data that would be of assistance to the Los Angeles Chamber of Commerce.

On Question No. 2—"Do you read circular letters?"

"No; they never arrive at the psychological moment."

"Yes, when brief."

On Question No. 4—"Do you read booklets and pamphlets?"

"Yes, if beginning is interesting."

"The title page—and more if it appeals to me."

"If short and attractive."

"Many club women consider them a nuisance."

On Qestion No. 5—"Do you read magazine advertisements."

"Yes, if magazine is reliable."

On Question No. 7—"Do you read street car advertisements?"

"If attractive."

"Yes, for pastime."

"You can't help it."

"Have to."

"Not from choice."

On Question No. 8—"Do you read billboards?"

"Yes, in spite of myself—no denying their psychological effect upon the subconscious."

"Always in order to avoid buying the articles—except as a last resort."

"No, despise them."

"Yes, because I can't help myself."

"Only for theatrical announcements."

On Question No. 10—"Do you prefer advertisements with illustrations?"

"Not necessarily—if actual information is desired. Illustrations necessary to attract attention to new articles."

On Question No. 13—"Have you faith in comparative prices?"

"Depends on who quotes them."

On Question No. 16—"Have you confidence in advertising generally?"

"Not when its effort is to make me buy something I do not need."

"Increasingly so; depends on firm advertising."

Miscellaneous Comments

"Success to you! It is not only a pleasure, it is a liberal education to study advertisements in our high class magazines."

"I read mainly for facts and prices—secondarily to study the psychology of the ad. They are often quite clever and interesting. The more clever and interesting they are, the less I should be inclined to trust them."

"While advertising seems to be a vital necessity under our present economic system it seems to many thinking people that advertising is a great economic waste, and that it will become as unnecessary as to advertise postage stamps, when civilization has evolved a cooperative democracy. Meantime, God speed the Women's Advertising Club. Make your advertisements absolutely true and as attractive as you please. Of course, we all read and act upon them. Upon all else, do not state that YOUR firm sells the best at the lowest prices. That is hardly ever true."

"I certainly hope the women of the advertising club can put a stop to solicitations for business over the telephone. I pay for the privacy of a phone—not not for its abuse by people in shops I do not know or care to. I am constantly being annoyed. I ex-

pect to get the day's news in the newspapers where I look for all the news, not only social, and club, but also of the shops."

"I think the advertising women of Los Angeles are to be commended for this campaign. Advertising does mean much to the women of today. I heartily endorse anything they may do to do away with the horrible billboards which obstruct our view in the residence district and which frighten me when it is necessary for me to pass them at night."

Concrete Exampile of Results

One direct and gratifying result of this educational progranda was the fact that club women were not only quick to recognize its advantages, but to apply them in the conduct of their own affairs, as well.

The California Federation of Women's Clubs were brought to more forcibly realize that advertising performs a definate service in making a cheaper subscription rates possible by increasing the value of advertising space.

The federation saw the possibility of instituting a long-cherished ambition of cutting the subscription rate of its official publication in two if the women could be persuaded to do their part by upholding the advertisers.

Speakers were sent to the various clubs in the Federation to explain that the lower subscription rate was only possible if the women did their part—and not only read, but acted upon the advertisements.

COST ACCOUNTING AND UNFAIR COMPETITION

BY J. NELSON SHREVE

(The pressing problems of what to do about the cut-throat competitor, of whether the central station and the jobber should go out of the retail business, of how to make a success of your own concern — all hinge upon the question of cost accounting. An extract of the most significant statement from an address by the president of the Electrical Cable Company at the recent contractors and dealers convention at Saratoga Springs.—The Editor.)

The Greatest Need

The electrical industry is comparatively new, and one of its most serious faults is that it has not developed scientific merchandising to the same extent as older industries. The subject is a large one, and I shall refer only to one phase of it — cost accounting. Unless we have an accurate knowledge of costs, scientific merchandising is impossible. Inaccurate cost accounting is the real cause of most of the unfair competition that exists today. Let me illustrate what I mean by presenting a well known condition in the electrical industry.

The Solution of Central Station Competition

There are concerns whose activities include two or more of the factors between the manufacturer and the ultimate consumer. A light and power company may act as a distributor of electrical equipment; a jobber may do contracting work; and a contractor may be a wholesaler and a retailer of electrical devices. Serious objection has been raised to this practice on the ground that it promotes unfair competition. There are many who believe that each factor should be confined to its special function. I do not agree with this point of view. It is not economical to attempt to build artificial barriers in the channel of distribution. Unfair competition does not arise because the concern is operating more than one branch of the industry, but because it is not scientifically merchandising its goods or its brains, and the reason for failure to do so is faulty cost accounting. Costs are averaged with the result that a profitable branch of the business is often made to carry an unprofitable one. You recall the old saying, "Every tub should stand on its own bottom." This contains a sound economic truth. The central station, for example, is not an undesirable factor in jobbing or contracting or retailing, provided it recognizes the factors of cost applying to these branches, and thus preventing its main business from being used to create destructive competition in other lines of the trade in which specialist concerns depend for their entire living. Every branch of a business should be treated as a separate unit in the determining of costs and made to show a profit; otherwise it is working an injury to the trade as a whole from which it must itself suffer in time. Accurate cost accounting, scientific merchandising — on these depend the fullest development of our industry. As soon as they receive practical recognition, unfair competition will disappear. No concern can justly object to fair competition. If it cannot meet such competition the fault is in itself, and not in any extraneous condition.

Another Chance for Cooperation

The war has taught us many economic facts, and the necessity for practical cooperation is one and, perhaps, the greatest. The Government has recognized the necessity for holding in abeyance laws that obstruct legitimate cooperation, and this may be regarded as preliminary to their abolishment or amendment. In no time in our history has there been greater necessity for business men to cooperate in bringing about the scientific merchandising of our goods, our brains, and our experience. The winning of the war and the future prosperity of our country depend upon it. This is one of the principal problems of the War Industries Board at the present time.

FOURTEEN RULES FOR ELECTRICAL CONTRACTING PRACTICE

The following Code of Practice is recommended to architects, consulting engineers, contractors and owners as well as owners' engineers, by the National Association of Electrical Contractors and Dealers, the Executive Committee of which adopted and approved it as a step toward the standardization of many practices in connection with the original contracts and those for extras which, unless definitely settled in advance, leads to misunderstanding on both sides and frequently to controversies and litigation. The National Association does not, however, attempt to bind its members to use this code, but respectfully submits same for the approval of both customers and contractors.

Rule I. Contractors will submit bids for electrical work upon condition that a full set of plans, specifications and general conditions be placed at thir disposal for a reasonable time, free of cost, for use in their office for the purpose of preparing an estimate.

APPLYING CO-OPERATION LOCALLY

BY WALTER COX

(A local business building campaign participated in by central station, jobber and contractor-dealer for the purpose of educating the public to the use of electricity is here suggested. A practical method of putting an ideal into service which will demonstrate the cash value of cooperation. The paper is one which was delivered before the Monterey section of Electrical Contractors and Dealers by the president of that organization, who is also at the head of the Cox Electric Company of that district.—The Editor.)

In order to have co-operation and harmony in the electrical industry, a code of ethics must be established and maintained. In the industry as it is today there are five distinct branches to be considered, namely—manufacturer, jobber, central station, contractor-dealer and consumer. There are also three essential points to be considered, that is, education, publicity and service. So in order to bring about satisfactory results all must cooperate, as the problems of one are practically the problems of the other. The manufacturer must have a channel for the distribution of his product, and only through the cooperation of the jobber, central station and contractor-dealer can he create a demand for much of his product.

This is best attained by a closer affiliation with the various branches, especially the jobber.

The jobber in order to distribute the manufacturer's product must depend largely on the central station and contractor-dealer. A closer affiliation and a more careful study of local conditions such as, for instance, in districts and communities where there are already a sufficient number of contractor-dealers who maintain attractive stores and handle intelligently the public demands, who maintain a high standard of sales and workmanship, who meet all bills promptly and who cooperate with the other industries to raise the electrical industry to a higher standard, would prove mutually profitable. The jobber should be very careful about encouraging new contractor-dealers to enter a field already fully covered, as there is only a certain amount of business in that locality and overcrowding retards rather than encourages a healthy development of the field.

The central station must ever seek an outlet for the consumption of its current, and in order to do so must look to the contractor-dealer to create, install and maintain a service on current consuming devices.

How can this best be brought about? I believe it can be done by adopting the following plan which must start with the contractor-dealer as he is in closer touch with the consumer. I would suggest that all bona fide contractor-dealers in a locality formulate a plan of action covering a definite period, say for one year, along cooperative lines, such as educational advertising. In place of the small space usually carried by the average contractor-dealer and central station individually, why not pool the advertising and divide the expense in proportion to the number of those cooperating on some equitable basis? The ads should tie in with the national advertisements best suited to that locality; the object is to further educate the public to the uses of electricity.

I would suggest that the pro rata amount expended for educational purposes be 1% of the gross volume of business of those participating. So much for the educational feature.

Let us now consider individual service on devices previously sold. As an example we will assume that we sell Mrs. Brown a vacuum cleaner. We make a note of it and then once a month call her up and inquire if it is working to her entire satisfaction; this gives her the impression that we have her interests in mind at all times, and she in turn will think of us when she wants additional devices that we as a community are advertising, or will recommend us to a friend who contemplates buying; so while giving service we are getting the much sought publicity.

Before starting this advertising campaign the central station should be consulted and asked for suggestions and to eliminate that which is not favorable to its policy, also to add to it any suggestions which will tend to further the interests of both parties, such as giving space in their offices for the display of merchandise, cooperation in the advertising campaign and some definite system to insure the following up of prospects for devices, etc.

This plan if carried out will have a tendency to eliminate the encouragement of unintelligent competition, thereby raising the standard of electrical merchandising to a higher plane than ever before and insuring well satisfied consumers of both merchandise and electricity. The jobber and manufacturer are benefited through this plan by having a greater demand created for nationally advertised goods. The jobber has fewer losses through bad accounts, on account of better methods of merchandising by the contractor-dealer.

Through this cooperative plan the central station knows that its interests are being well taken care of. The manufacturer knows there will be a demand for his nationally advertised product—the jobber that he will be asked to supply it.

AN ETHICAL CO-OPERATIVE PLAN

(1) Just so many contractor dealers to a district as the trade will justify.

(2) A pooling of advertising, paid for proportionately according to volume of business done.

(3) Individual service on the part of every dealer.

(4) Tying-in with national advertising wherever it is locally applicable.

(5) Working in harmony with central station policies and with their active assistance.

NEW CONSTRUCTIVE COOPERATIVE WORK

(The California Electrical Cooperative Campaign is forging ahead, not alone in regard to numbers reached in its helpful activities but best of all in quality of service that is being rendered. Here is an account of the recent get together dinner in Oakland, California, and a statement of how a system of data is being collected that will remedy one great present ill in the industry—the lack of definite business statistics that will correctly portray the effective sales activities of the electrical contractor-dealer.—The Editor)

The regular monthly dinner of the California Association of Electrical Contractors and Dealers held at Hotel Oakland, Oakland, California, July 3, 1918, proved of unusual helpfulness. The occasion was given over to a consideration of the activities of the California Electrical Cooperative Campaign. This splendid ideal of mutual helpfulness has been too often reviewed in these columns to need further elaboration here, but the evening brought out in addition some ideals in helpfulness that may well be disseminated broadcast throughout the West and bear the thoughtful consideration of all branches of the industry. These new ideals center about two themes—the one concerns itself with a broadcast call that is being made in collecting sales data of the contractor-dealer and the other concerns itself with the question of priority orders of the War Industry Board that bid well to call for the patriotic support of all branches of the industry.

The meeting was brim full of good fellowship, and community singing was enjoyed throughout the entire evening by the ninety-five guests in attendance, who represented all branches of the industry.

C. B. Kenney, of NePage McKenny Co., acting as chairman of the evening introducted L. H. Newbert, manager of the commercial department of the Pacific Gas & Electric Company who is chairman of the advisory committee of the California Electrical Cooperative Campaign. After Mr. Newbert had explained the purposes of the campaign, laying special emphasis upon the fact that the campaign is wholly educational in character, R. M. Alvord, local manager of the supply department of the General Electric Company and in charge of publicity for the campaign, brought out the effective work that is being done by the technical press in disseminating the helpful work of the campaign throughout the length and breadth of the country.

Mr. Alvord especially called attention to specific articles that have appeared in the technical press and urged upon those present the necessity of each one supporting the press to the fullest extent. He also urged that each one exert a more directive effort in reading the articles that appear in the technical press and when thus thoroughly versed in the views of the campaign, that each talk the campaign to at least one different person a day.

M. L. Scobey of the Home Electrical Company then presented a paper on "How the dealer can support the campaign" which is reproduced in full below as it adds a distinct new piece of constructive work in electric cooperative ideals.

H. C. Reid, president of the California Association of Electrical Contractors and Dealers, dwelt upon "the place for the electrical contractor" in his remarks. Mr. Reid brought out the fact that, while

A TYPICAL MONTH'S REPORT

The appliance sales blank as used by the California Electrical Cooperative Campaign. These forms are to be filled out as indicated in the accompanying sample and handed in monthly. The individual reports are confidential, but summaries and totals serve as a fair barometer of the practical success of the campaign.

REPORT OF ELECTRIC APPLIANCE SALES

To CALIFORNIA ELECTRICAL CO-OPERATIVE CAMPAIGN

Contractor Dealer · Service Elec Co Address Mc Minnville, Cal. Month Ending July 31, 1918

APPLIANCES	NUMBER OF APPLIANCES SOLD BY DAYS																													TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	WATTS
660 W. and Under:																																
Air Heaters														1							1										1240
Chafing Dishes—Teapots																																
Curling Irons—Hair Dryers	1				1							1															1				100
Disc Stoves—Grills	2					1			1		1				1					1		1	1	1	1	3	1			1	9600
Fans																																
Irons—Domestic	1		2		1	3	2				2		1		2	1	3	1	1	1		1		1		3	1		2	1	16500
Motors under 1 H. P.																																
Percolators	1										1																					500
Toasters																1								1					1			900
Vacuum Cleaners																																
Washing Machines																																
Water Heaters															1																	300
Misc.								1				1																				500
TOTALS																																29640
Over 660 Watts:																																
Air Heaters—Radiators			1																													1000
Disc Stoves																																
Irons—Laundry—Tailor											1					1																1600
Ranges																																
Water Heaters																																
TOTALS																																2600
Motors:																																
1 H. P.																																
2 H. P.																																
3 H. P.																																
5 H. P.			1																													5000
7½ H. P.																																
10 H. P.											1																					10000
15 H. P.																																
20 H. P.																																
25 H. P.																																
30 H. P.																																
Other Motors and Power Equipment																																
TOTALS	5		3	1	2	4	2	1	1		6	2	1	1	4	3	3	1	1	2	1	2	1	3	1	6	3		3	2	15000

direct helpful results had not as yet been experienced by the electrical contractor from the three months' work of the campaign committee, he was convinced that indirect results in increased installation work due to increased sales of the dealer was bound to follow. The fact that a new district has already been created among the California Association, and another probably soon would follow in addition to many new members to the association, he stated evidenced the beneficial results that are coming to the contractor-dealers throughout the state even at this early period. In conclusion he stated that one of the prime objects of the association was not only to create better merchandising methods among contractor-dealers but to instill more confidence in the electrical industry as a whole.

D. E. Harris, sales manager of the Pacific States Electric Company, and a member of the advisory committee gave a forceful discussion of the "priorities orders" that have just been issued to manufacturers, jobbers and contractor-dealers by the War Industries Board. Mr. Harris clearly explained why the new orders were being insisted upon and through his earnest plea led his hearers to pledge inwardly everything within themselves to patriotically forward the priorities work and to live up to the pledge forms requested.

Albert H. Elliott closed up the evening by bringing home to his hearers again the fundamental principles of cooperation—namely by the establishment of an all embracing system of ethics for the industry and then the sacred observance of these standards in actual life practice.

HOW THE DEALER CAN SUPPORT THE CO-OPERATIVE CAMPAIGN

BY M. L. SCOBEY

A Dealer's Compaign

The Cooperative Campaign now in effect is essentially the dealer's campaign because he first had it in mind and when the opportunity presented itself at the Riverside convention of the National Electric Light Association, he did not hesitate to ask for it, and later, at the proper time, backed up his request with cold cash.

The Opportunity

Now, speaking as a dealer to other dealers, do you realize or appreciate that you are or can be an important factor in the third or fourth largest industry in the United States, namely the Electrical Industry? Do you fully grasp the fact that California's electrical energy takes either second or third rank in the whole United States and that you are being relied upon to do the lion's share in exploiting the sale and use of our enormous amount of current?

This cooperative campaign needs active support and especially your support, as you were the prime mover both in it and for it. Don't fall down on the job.

Cooperation Includes Everybody

Remember, this is a Cooperative Campaign and in order to be a complete success, the cooperation must come from all those concerned or interested in it and in my estimation, the dealer's place should be first in this educational and constructive work.

First of all, bear in mind the name:—California Electrical Cooperative Campaign—Four branches of the industry are giving it their financial support.

1st. Central Stations
2nd. Jobbers.
3rd. Manufacturers
4th. Contractor-Dealers

I know the first three are giving a great deal of time, thought and extra expense, to the end that the campaign may be a success as far as they can make it, but the question is, are the dealers doing likewise, are they doing their full share?

The entire success of the campaign rests largely on the contractor-dealer and it is only natural that he should give his real, active support, because while all parties concerned are eventually going to profit from the results, the contractor-dealer is the one who will profit three-fold, because if his work is a success, he necessarily profits first and the others, later on, in their turn. It would seem that it is a goal worth striving for.

No one dealer can get the results by himself, even though he devoted half his time to it, so of necessity, the desired results can only be obtained through real cooperation.

Practical Steps to be Taken

Get together with other dealers in your community or district and talk over your problems and if there are any differences of opinions or wrongs to be righted, let the man who is in the wrong be man enough to admit it and let the other fellow be man enough to forget all about it after any such differences are straightened out. Unless this is done, no permanent good can obtain:—in other words get right yourself, know that you are doing the right thing, not only for yourself but for the other fellow as well and you will find that it won't be long before he knows and appreciate it. And that means money in your pocket.

Next, change your shop into a real store—it doesn't take so very much time or money to accomplish satisfactory results. Keep the place clean and the stock looking bright and in order. Make it attractive to the women who are or should be your best customers.

Display Windows Help

Your display windows are your "one best bet" and should be changed frequently. Don't make the mistake of putting too much on display at any one time. And see that the articles are priced, because in nine cases out of ten, the woman will decide on a purchase if she sees it is within her means, while if the price is not shown she is apt to pass on rather than take a chance of inquiring and then have to make some excuse for not buying, if she finds the price to be more than she expected.

Wherever possible, have a card or series of cards explaining the use of the article, the results that may be obtained, its simplicity of operation or other points that might excite the woman's desire to buy.

Working with the Central Station

Next, get acquainted with the central station manager and his various employes. Find out his views of local conditions; find out what they are do-

ing or would like to have done to improve the business as a whole. Tell him what the dealers are doing or would like to have done. There couldn't be a more opportune moment than right now for you fellows to get together and accomplish more than you ever dreamed could be accomplished. The central station's problems can doubtless be helped by your cooperation and it is certain that he is in a position to help you.

Report on Appliance Sales

I have reserved the vital, and, in my estimation, the most important item until the last and it is this: Don't neglect or be ashamed to send in to Mr. Redpath your monthly report on sales of current consuming devices. I take it for granted that you have all received a copy or rather a pad of the reports that I refer to. I don't really believe that you appreciate how important this monthly report is or how much it is going to mean to you in the future. Please bear in mind that the information embodied in this report is held strictly confidential and is not for publication or use other than that originally intended.

It makes no difference whether your total sales for the month amount to only two toasters, one flatiron and a fan, send it in, because your committee needs and must have a record of every sale made by our members so that we may be in a position to tell the Pacific Gas & Electric Company that our members have put current consuming devices on their lines to a total of five thousand kw. in a certain period, or we can say to the Southern California Edison Company that we have increased their load by so many thousand kw.

Showing the Campaign a Success

Summaries of these reports are going to be concrete evidence to the central station people that their confidence has not been misplaced and that their donation to the campaign fund has been one of the most profitable ones they ever made and at the same time show them that the members of the California State Association of Electrical Contractors and Dealers are ready and in a position to do efficient merchandising.

PRIORITY POLICIES AFFECTING THE ELECTRICAL INDUSTRY

BY D. E. HARRIS

The War Industries Board is issuing a statement of policies which should command the careful and earnest attention of the business and industry of this country generally, particularly as represented through War Service Committees of the various industries and commercial organizations as set forth in War Bulletin No. 35. The statement is as follows:

1. In pursuance of the authority expressly conferred by the President in appointing the undersigned Chairman of the War Industries Board, there has been created a Priorities Board consisting of (1) the Chairman of the War Industries Board, (2) the Priorities Commissioner, (3) a member of the Railroad Administration, (4) a member of the United States Shipping Board and Emergency Fleet Corporation, (5) a member of the War Trade Board, (6) a member of the Food Administration, (7) a member of the Fuel Administration, (8) a representative of the War Department, (9) a representative of the Navy Department, and (10) a member of the Allied Purchasing Commission.

ELECTRICAL MANUFACTURERS' PLEDGE:

"For myself, my corporation, or my firm, I pledge

I. The conservation of all raw materials and supplies now on hand or later to be issued to me;

II. The maximum possible utilization of all materials and supplies for essential war purposes;

III. The prompt production and delivery of the largest possible quantity of finished product that is or shall be required by the United States Government for the interests of itself or its allies;

And I further agree that all other lines of our business shall be subordinated to this pledge and

All this in accordance with the suggestion of the War Industhies Board."

ELECTRICAL JOBBERS' PLEDGE:

We Hereby Agree:

That all **Rigid Conduit, Elbows and Couplings** shipped by you to our stock or for our account will be used for direct or indirect Government requirements or for work of exceptional or national importance, classified as follows

1—Direct Government Orders.
The term "Direct Government Orders" signifies any order or contract placed by the War Department or the Navy Department of the United States, or the U. S. Shipping Board Emergency Fleet Corporation, or by the Allies.

2—Indirect Government Orders.
The term "Indirect Government Orders" signifies materials, supplies, or equipment necessary in the manufacture of or as component parts of direct Government orders.

3.—Work of Exceptional or National Importance.
"Work of Exceptional or National Importance" shall be taken to mean work which, while not primarily designated for the prosecution of the war, yet is of great public interest and essential to the national welfare, such as equipment and supplies for railroads and other public utilities; equipment and tools for mining of fuel and ores required in war work; agricultural implements; food containers; repairs to existing industrial machinery, and other work of similar character. In compiling reports covering orders placed subsequent to August 1, 1918, the term "work of exceptional or national importance" shall be taken to mean, orders covered by Class B priority certificates or taking Class B automatic rating under Circular No. 4 of the Priorities Committee bearing date of July 1, 1918.

4.—Orders for Export on Which Export Licenses Have Been Issued by the War Trades Board:
a—To active allies.
b—To neutral countries.

5.—All Other Essential Work.

2. As this Board is composed of authorized representatives of the Governmental agencies principally concerned with war industries and supplies, it is not only peculiarly fitted to determine general principles and define basic rules which shall govern priorities of production and delivery of materials, equipments and supplies, but also, as pointed out by the President, its composition insures "common, consistent and concerted action" in carrying such determinations into effect.

The following resolution was on March 21st, 1918, unanimously adopted by the War Industries Board:

"Whereas it has come to the notice of this Board that new industrial corporations are being organized in different sections of the United States, for the erection of industrial plants which cannot be utilized in the prosecution of the war, and

"Whereas plans are being considered by certain states, counties, cities and towns for the construction of public buildings and other improvements which will not contribute toward

winning the war, and

"**Whereas** the carrying forward of these activities will involve the utilization of labor, materials and capital urgently required for War purposes: now, therefore, be it

"**RESOLVED,** By the War Industries Board, That in the public interest, all new undertakings not essential to and not contributing either directly or indirectly toward winning the war, which involve the utilization of labor, material and capital required in the production, supply or distribution of direct or indirect war needs, will be discouraged notwithstanding they may be of local importance and of a character which should in normal times meet with every encouragement; and be it further

"**RESOLVED,** That in fairness to those interested therein notice is hereby given that this Board will withhold from such projects priority assistance, without which new construction of the character mentioned will frequently be found impracticable, and that this notice shall be given wide publicity that all parties interested in such undertakings may be fully apprised of the difficulties and delays to which they will be subjected and embark upon them at their peril."

While this resolution is self-explanatory, it may not be improper to say here that the War Industries Board has not undertaken to classify any legitimate industry as "non-essential" but only through the exercises of priority directions to insure supplying to direct and indirect war industries as nearly as possible one hundred per cent (100%) of their requirements.

This Board needs, welcomes, and confidently expects to receive the active assistance and wholehearted cooperation of the business men of this nation, that it may to the fullest extent enjoy and have the benefit of their knowledge, judgment and experience.

IMPORTANT NOTICE

By agreement with the Government, we are conserving our stock of materials and finished products for direct and indirect Government requirements and have only slight discretion in the matter.

If you favor us with an order—if for Government work—give name of the first contractor, the Government or departmental order numbers and the priority certificate numbers.

IF NOT for Government work, state the name of the ultimate user, character of product produced and relation of apparatus or supplies thereto.

WITHOUT THE ABOVE INFORMATION WE CAN NOT ENTER YOUR ORDER.

Notice sent to Jobbers by Manufacturers

LETTERS FROM A JAPANESE ELECTRICIAN

(Nogo listens in at the Oakland dinner and is puzzled by what he hears. What contractors do to win the war and various other timely topics discussed by a Japanese electrician.—The Editor.)

To Editor trade newspaper for electricians,
enlightened printer who manufactures
facts for reading peoples,—

Dear Sir:—

Last Tuesday evening p.m. I am wiring new asbestos house for quick burn-down Hotel Oakland.

Just at time when new daylight saving days get too dark and new lightless night order compel Japanese electrician to stop work because no can see

According to Nogo, people who "corporate" at a dinner and then fail to apply it in real life are like the "Japanned house boy" who goes to a Christian Sunday School and then steals the rice from the mission window sill as an offering to his Buddha.

I herd much loud talker out of open window. One base sound voice narrate "More better that contractor be the property of electrical association."

Loud glib singer Redgap of Ruggles warble to tune "Funyknee Funybone," "Corporate, corporate, corporate," and much corporation man divulge "Banzai, Hurry!" and I listen to no one warble "Come Pete, let us have drinks."

So, Mr. Editor, I climb up fire get-away to discover how American electrician plot to get sheep of Japanese electrician and other mans who play game not too farely. I enjoy much cramped feelings for two lengthy hours and hear foreign things which I ask you to explanate to me.

When I go home I require to Jackie, which is American short hand name for noble Samurai who share my room-rent, "Why electrician talk so much about corporate and why so little work with each other?"

Jackie renig "American wire man get close together, eat with each other, play in concert, and fight with each other. Is that not too much enough get together?"

Whereas I snigger, "American contractor pay much captured capital to Redgap and Yelliot to narrate the handsomeness of harmony and then go out and cut each other at the throat. Is this not like Japanned house boy who go to Christian sunday school and then steal rice from pantry for Japanese buddha?"

Jackie ask to know "What do electricians learn at get close together dinner where no room for elbows and soup-spoons?"

For him, with face filled with jolly I retail Martial Scobey second-story about the working girl in overalls who telephone "Conserve me, conserve me" and the brave draft-age man who conserved her.

"What junction town is that with serious purpose 'how can electrical faro dealer get something for nothing out of corporations educational champagne?' " retort Jackie.

"Bevo Junction" I corrode with American eyewink and think that this was fit reply to win promised prize from Scobey.

"What did that wondrous rorator Yelliot divulge?" ring up Jackie.

I take notebook from my pocket to read "Oh how I love this sunburned land, burbanked by top-lofty Sierras, bath-tubbed by vasty Pacific and needle-threaded by streams of silver dollars where electrical men live together in pieces and hominy."

"But what thought did he say?" Jackie respond politely. "Those wordy pictures diffuse me."

I rung my sole out to think back what thoughts he utter but collected only alltrueistic nouns about vague ethicks.

Mr. Editor, I inquire to learn from your deep know-all what is there different between sell-fishness and self interest and compound interest on profits in the electrical business. Please to answer by returned mail.

Then Jackie retorts "What else respired at this attended society for learning how to do christianly?"

"They say-so 'Do the other fellow before he does you' " I retaliate.

"But what were the reel facts displayed to such a prominent gathering?" he come back.

I called again to brain the secret report of sales to Electric Appliance which each dealer is respected to make out each monthly period.

"Why so much records" Jackie deport.

"So the central stations can know whether they are getting their bait back" I negotiate.

"What are electricians doing to help win the war?" propound my Japanese friend who help me when not laboring at house-keep by day or hour in small families.

"They go to jabber-fests oftenly and hear big prominent men tell how soldier boys over there ought to back up business men over here" I compile. "They also enjoy no jobs because honorable emperor Wilson decry house-building in these fierce times."

"But what they do to keep wolf from gnawing the door knob while high-living costs expand?" require my querulous friend.

"They guess foolishly about cost of water-tight ship wiring" was answer from me.

"What is the useful when ship yards wire the emergency themselves" he snore in bed.

So I too retire from wakeful time and dream delightfully that I die and go to eternal regions where I discover beautiful contractors association. It has grand display room of electrical fixtures on main street where architects and owners pass oftenly. A high-waged secretary sit at big mahogany desk with casters in Oriental rug from Oregon woolen mills. Every contractor sent in sealed envelope stuffed with bid on each job. Oh, it was so perfection that I asked Jovian devil imp to knock me down to the secretary.

I am delighted and ask to know the dues. "The jobbers pay them" are slight modesty from him. "Every member has sky-limit credit" he addition, "and no priority orders are needful for wiring jobs."

"Can Japanese electrician join?" I anxiety.

"No, that's the Hell of it" he exclaim.

Then I wake up with sympathy of relief.

Hoping you are the same,

HASAMOTO NOGO.

THE RIGHT WAY TO FIGURE PROFITS

BY JOHN BRAY

(More important even than increasing volume of business is to make a profit on the business that you handle. You may figure 15 per cent profit and still come out at a loss. How to avoid this by figuring on the basis of your selling price is here concisely urged by the credit specialist of the San Francisco office of the Western Electric Company. — The Editor.)

What the Profit Should Be—

There has been a great deal said and written during the last few months about "Business Efficiency," not only concerning the electrical contractor-dealer, but also regarding all retail merchants in general. One very important point, upon which too little stress has been placed, is the proper manner in which profits should be figured on work. It does not seem to be the general understanding that profits should be figured on the selling price rather than on the cost of labor, plus material, plus over-head. The sum total of these three items represents the actual costs on work, provided no mistake has been made in figuring. Overhead expense percentage is figured on total sales. Likewise, the profit percentage must be figured on total sales, which is the sum total of selling prices.

In order to obtain

20% on selling price, add 25% to costs;
25% on selling price, add 33 1/3% to costs;
33 1/3% on selling price, add 50% to costs.

How to Figure It—

The selling price is obtained by adding the desired percentage of profit (not less than 15%) to the percentage of overhead expense (general average 25%), and deducting this from 100% gives the percentage of cost to selling price. The cost, divided by the difference (60%) gives the selling price. For example: the overhead expense is 25%, and it is desired to make a profit of 15%: 100% must be the selling price. 25% overhead added to 15% profit equals 40%. This deducted from 100% selling price, equals 60%, which is the percentage of cost to selling price. In order to obtain the selling price on a job on which the cost is—for example, $100: Divide the cost, $100, by .60, equals $163, the proper amount that should be charged for the work.

Losing Money on Profits—

Figuring on the cost basis, 25% overhead added to 15% profit, equals 40%. The cost, $100—multiplied by 40%—equals $40, which would be the profit added to the cost, making total price of job $140. With an overhead expense of 25% the job would show loss instead of a profit, for 25% of the selling price figure, $155, is $41.50, or the total of actual expenses compared with a total profit of $40, figured on the cost basis. On the cost basis of figuring a loss would be made on all jobs. The profit on the selling price figured of $166, after deducting the overhead expense of $41.50, leaves $25.50, which is only a fair and reasonable profit.

The Desired Result—

This lesson will bring out the real need of figuring on the basis of the selling price, so a profit can be made which will leave something after taking out the expense of running the business.

WIRING AND EQUIPMENT FOR RADIO INSTRUCTION

BY W. HAYNES

(Hundreds of radio schools have started within the last year to meet the emergency calls for operators—and these in each case must be properly wired and outfitted. Many inquiries have come from schools wishing to learn how the problem may be met and this account of a successful solution in Portland, Ore., by the principal of the Portland Y. M. C. A. Radio School offers original matter of unusual interest.—The Editor.)

Difficulties of Present Methods

Since the United States has entered the war, a large and insistent call for radio operators has existed. The Portland Y. M. C. A. School of Radio Telegraphy was remodeled and enlarged, so as to handle about fifty men in a class, and by running parallel classes at staggered periods throughout the day, the school was able to handle all the men that made application for wireless training.

The usual method of teaching code is by means of an ordinary buzzer, or preferably one with pitch somewhat higher than the ordinary buzzer.

Where a large number of students are to be trained, there will be found to be various degrees of learning ability. Some of the men will quickly advance to the point where a speed of code practice which would be proper for them would be of little

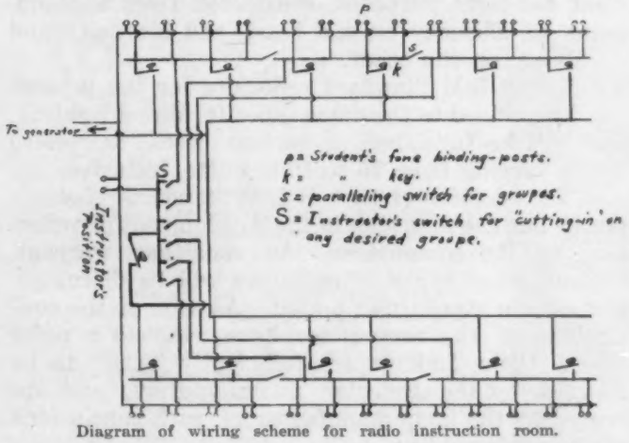

P
To generator
p = Student's fone binding-posts.
k = " key.
S = paralleling switch for groupes.
S = Instructor's switch for "cutting-in" on any desired groupe.
Instructor's position

Diagram of wiring scheme for radio instruction room.

value to slower men. This at once necessitates having two to three buzzers operating independently; and if in the same room considerable annoyance is caused by their interfering with the students, even though the pitches of the buzzers may be entirely different.

It may be remarked that reading through interference is a desirable practice for advanced students, but for beginners it is entirely detrimental to their progress. One remedy for this interference would be to use separate rooms, but this again would demand additional supervision, which in general it is desirable to avoid, owing to the scarcity of teachers and class rooms.

Another feature of the buzzer work is that the student is practicing on sounds which are "out of the air," as it were, and which are not exactly the equivalent of the sounds received in actual radio practice, since such sounds are invariably received through watch case receivers held to the ear by head bands.

The Improved System

The undesirable features of the above method were avoided by employing the wiring system as indicated in the figure. The plan of the tables is essentially the letter "U", with the instructor's position at the bottom of the "U". From this position he can communicate with any group of students at any table in the room by closing the corresponding switches which are placed near the master key.

The tables contain fifty-two positions, and these are wired together in groups of about four to six positions each. A wire is run from each position to the corresponding switch at the instructor's position. The instructor, therefore, may tie any two positions together so that they may work back and forth, or he may tie them all together, or cut them entirely apart. Switches are provided also on the tops of the tables, so that the students may at will tie their group of positions to a neighboring group, should intergroup work be desired.

A position in the sense here used includes a key, a pair of binding posts to the left of where the student would naturally sit, and a drawer locker, containing a watch case receiver, head-band and cord. The locker serves the student also for keeping books, pencils and scratch tablets.

The Source of Energy

The source of electrical energy for this system is the only satisfactory one of several that have been tried during the past several years. It is essentially an inductor type of high frequency alternator. We have a Westinghouse three-speed dental motor of about one-twelfth horse power to drive our alternator. The alternator consists of a disc of compressed fibre of ¾ in. thick by 11 in. outside diameter. The disc is carefully mounted on a machined hub, which in turn is mounted on the shaft of the motor. A row of eighteen ⅝ in. holes are drilled through the disc about ⅞ in. from its periphery. Considerable care is exercised to space these holes uniformly and parallel to the axis of rotation... ⅝ in. Norway iron plugs with approximately hemispherical ends were turned of a size sufficiently large to require a vise to force them through the holes. One object for rounding the ends of the plugs was to get an approximation to a sine wave e.m.f. induced in the armature, since such a wave form will be easiest on the ear (and this is a rather important factor, since the student must hear the buzzing sound so many hours per day).

The Armature

The armature for this motor consists of a laminated rectangular core of about ¾ in. square cross section. A section of one of the short sides of the rectangular core is cut away sufficiently to allow the plugs carried by the fibre disc to pass through as the disc rotates; thus it will be seen that the magnetic circuit is alternately closed through the plugs, and then opened as the plug moves away, which in turn

gives rise to a pulsating flux through the core, if it carry a small excited field coil. The field coil consists of forty or fifty turns of No. 18 wire. The coil receives about 4-10 ampere through an incandescent lamp from the lighting mains. The armature winding consists of about 150 turns of No. 16 wire, wound over the field coil. The frequency of the armature current depends, of course, upon the speed of the motor, and the number of inductors on the disc. In our generator we have a variation of from 500 to 1000 cycles per second.

Regulation and Flexibility

The regulation of this type of alternator was surprisingly good. We found that 25 or 30 75-ohm phones, connected in parallel, could be loaded upon the armature without affecting the strength of the signal received by another phone; thus we did not find "cross talk" or interference with one section by another, as anticipated.

The Work of the Past Year

During the past year the Association's school has trained between 250 and 300 men for the National service. The distribution of these men between various services is approximately four to the Navy, four to the Signal Corps, and two to the Aviation Sections out of each ten students.

Many of the men are taken away before the completion of their training by the operation of the draft regulations. The men who do not finish the complete course, however, usually reach a point which guarantees their admittance to some section of the army or navy radio schools where their course is completed.

REFLECTOR STANDARDS ADOPTED

(A new standardizing program which gives the industrial trade a lighting unit embodying the best ideas of both the metal reflector and lamp manufacturing organizations. In view of the vital part the Journal of Electricity has taken in the development of industrial lighting in the past this announcement holds particular interest.—The Editor.)

The Associated Manufacturers of Electrical Supplies, through their Reflector Committee, have been working for some months over the problem of setting and adopting standard dimensions and other specifications for porcelain enameled steel reflectors.

The difficulties attendant upon this work were many and, inasmuch as the physical properties of reflectors are directly dependent upan lamp dimensions, the development of standardized reflector designs was carried on by joint meetings of the committees of both the reflector manufacturers and the engineering departments of the various lamp companies. These joint meetings were the result of appreciation by the reflector manufacturers, not only of the great advantages to be derived by the purchaser of standardized reflectors, but also the benefits derived by the lamp manufacturers on account of their interest in securing the best type of reflectors for their lamps.

As a result of these meetings certain standard dimensions and specifications for dome reflectors were adopted by the reflector manufacturers. These manufacturers will, within a short time, place upon the market dome reflectors under the trade name or designation of R-L-M Standard, meaning **Reflector and Lamp Manufacturers' Standard.**

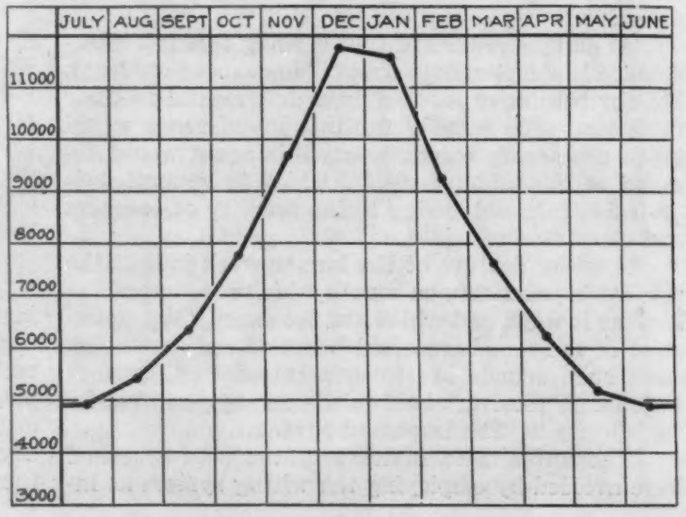
Entering into the discussion was a question of the character of the porcelain enamel surface. The outcome of this discussion was the adoption of a quality of enamel which is regarded as the most efficient for light purposes, considered from a standpoint of efficiency on one hand, and elasticity and durability on the other.

The R-L-M Standard reflectors for the present will be confined to the dome types for direct lighting, and will be furnished in various sizes to receive lamps varying from 75 to 1000 watts, inclusive.

The adoption of these R-L-M Standard reflectors marks but the first step in the development of reflectors by the committees. As conditions warrant, various other types of reflectors will be discussed, and certain standards adopted. As soon as the conclusions of the committees have reached a point where their findings are sufficiently exact to be adopted by the reflector manufacturers, and approved by the lamp manufacturers, such conclusions will be made public.

More detailed information concerning the R-L-M Standards will be published by the various reflector manufacturers individually through such channels as they themselves may select.

"IT PAYS TO INVEST in adequate illumination"—is the argument which sells most industrial lighting improvements—and the accompanying chart is proof of the argument. The curve indicates the number of accidents occurring per month throughout the year, and it will be obvious at first glance that the largest number occur in the darkest months and that the relation with the lengeth of days is consistently maintained throughout the year. The data is taken from a recent issue of the Safety News, published by the California Industrial Accident Commission.



A NEW HOME IN THE NORTHWEST

(The Gasco Building on Fifth and Alder Streets, Portland, Ore., becomes the new home of the Pacific Power & Light Company. Attractive offices and efficient arrangement make for satisfied workers and satisfied customers.—The Editor.)

The accounting department utilizes the greatest amount of space on the third floor. It is interesting to note that this department contains the largest staff of employes in the general office. As in any business, the accounting end has fully as much importance as the producing—it is, in fact, the medical department of business, that which keeps it in good health or prescribes the remedy if the temperature drops too low.

The board of directors' room is of ample dimensions, beautifully furnished in mahogany with a new directors table, large enough comfortably to take care of a full attendance of members of the board. Simplicity and good taste make their impression of well founded prosperity here as in any business furnishing.

The assembly room is a new social feature, designed to foster good fellowship and good feeling among the employes. It is used constantly by the women employes as a lunch room, being fully equipped with lunch tables, gas range, cupboard, silverware, dishes, percolators and other accessories. One end of the hall is tastefully furnished in wicker and admirably serves the purpose of a rest and recreation room. Cheery chintz covered chairs, an inviting chaise-lounge, and magazine littered table promise to make this corner a most popular retreat.

AN ENFORCED SHUTDOWN IN THE POWER INDUSTRY

BY J. LIGHTBODY

(In these trying days the continuity of service in the supply of electric power becomes a national service of the first order. It concerns the life and welfare of every citizen and may indeed enter as a factor in the outcome of the present great world struggle. This enforced shutdown of the British Columbia Electric Railway Company, Ltd., with which the author is connected, should receive the thoughtful consideration of every citizen. Further comment on this timely subject will be found in the editorial pages of this issue.—The Editor.)

The placing in jeopardy of so essential a public service as light, power and electric transportation by the action of a body of men who acknowledge no responsibility to the public, we believe, is a situation which should not be allowed to pass without a warning.

During the last few weeks, an unprecedented state of affairs has arisen in Vancouver due to the action of the operators of the power plants and substations of the British Columbia Electric Railway Company, Ltd., at Vancouver, B. C., in wilfully attempting to close down all electrical supply as a means of enforcing their wage demands and other alleged grievances. The details of the actions which preceded the shutting off of power at midnight on Saturday, July 13th, without notice being given to the company or the public warrant full disclosure.

What Happened Prior to the Shutting Off of Power

The agreement between the British Columbia Railway Company, the Western Power Company and the British Columbia Telephone Company respectively and the electrical workers expired on June 30. Previous to that the men laid a new agreement embodying many drastic increases and changes before these companies. The two first named offered the men increases of 10 per cent but they were refused. Accordingly a conciliation board under the Lemieux Act of Canada was proposed but the men refused, thereby necessitating the Dominion government to name an arbitrator for them. The conciliation board was formed but the electrical workers refused to recognize it.

In the meantime, an arbitration with the street railway men employed by the British Columbia Railway was going on but its sessions did not close until June 28 and no time was left in which to bring down a decision before June 30. The men in both unions decided to go on strike at midnight, July 1, in contravention of the law of Canada.

It is believed that the electrical workers fully intended that Vancouver and the surrounding country should have been left without light or power on their going on strike but the Electrical Superintendent, and some seven or eight of his assistants, maintained the service in a score of substations scattered over the mainland. No inconvenience was occasioned except by the absence of street car service, both because the street car men were on strike and because the handful of men could not keep the rotaries in operation.

On Thursday morning, July 11, about 1:10 o'clock, the company came to a settlement with the two unions and agreements were signed. Service resumed the same day. It was believed that the matters had been finally settled with the exception of one or two minor details such as free transportation and a lighting rate concession which had by consent been left to be adjusted later.

Effects of a Shutdown Without Notice

The astonishment of the whole district, the management included, may be judged when a few minutes after midnight on July 14, suddenly and without warning all lights, power, street cars and interurban cars fed by the British Columbia Electric system stopped. Thousands of persons were abroad at this hour. Street cars were loaded. Interurban cars were miles from their destinations. One car with 60 passengers and another with about 50 had set out from Vancouver for New Westminster. A train with 70 persons in it was stalled at New Westminster, unable to proceed along the Fraser Valley division. Other interurban cars were stalled on the Lulu Island and Burnaby lake lines, each with passengers in them.

The effect of the stoppage of light and power in hospitals and cold storage plants need not be emphasized. It is evident, however, that the men intended to make the tie-up complete because not a switch was left in place in the main receiving station.

The Electrical Superintendent arrived there within a few minutes and found a large group of linemen and operators around the station. Luckily he had an electric torch in his automobile for without it, he would hardly have been able to make his way through the station. There was not a lantern left. The substation had been deserted.

The Shutdown Made Without Authority

All that we were able to ascertain was that the operators had received orders from some one unknown, not the load despatcher, to close down the plant. The operators at the Lake Buntzen hydroelectric plant were telephoned to and they threw off the machines there. All switches throughout the country were pulled, thus entailing a tremendous mechanical task to reinstate them.

Superintendent Newell immediately got in touch with Lake Buntzen and aroused the superintendent there, who had retired for the night. Other engineers arrived and in 40 minutes the most of the city load had been picked up and an hour and a half later most of the railway lines were operated and cars able to proceed to the barns. Many of them finished their owl runs.

An attempt was made to arrive at the cause of the trouble but communication with E. H. Morrison, business agent for the electrical workers, could bring no coherent account. Mr. Morrison intimated finally that they would not meet the company in any way unless the electrical superintendent was discharged. On Sunday morning Mr. Morrison called up and asked if this had been done and when he was told

that it had not, he refused to have further communication with the company. He mentioned that other unnamed officials would have to be discharged also.

The company understands and it has been stated in the newspapers that the men's union have cabled to the directors of the company in London, England, demanding the dismissal of the electrical superintendent.

A Joint Committee Attempts to Settle the Difficulty

On Sunday, July 14, members of the board of trade and Mayor Gale formed a committee to endeavor to bring about a settlement. Street cars were again tied up owing both to the scarcity of current and to the refusal of the men to work while the electrical workers were on strike. A joint committee was formed having on it several labor representatives and the company laid its case before them.

The men demanded transportation and lighting concessions and although we pointed out that these had never come up, we granted them forthwith.

They alleged that 25 men had been dismissed in discriminating fashion and strike breakers kept on.

Mr. W. G. Murrin, assistant general manager, showed clearly that the men who had been laid off were linemen and groundmen and were extra staff that had been working on special work which the company expected to lay off several weeks since on the completion of the work. These men were laid off strictly according to the length of their service and not a single non-union lineman or groundman was in the employ of the company.

The men demanded the dismissal of Mr. Newell, but it was pointed out that these 25 men had not been laid off by him, but by the foreman in the regular course of work. The company, however, agreed to place the case of the electrical superintendent up to arbitration while the electrical workers should go back.

The Joint Committee Takes Action

This solution was accepted by the joint executives of electrical workers and street railway men who promised to recommend it to their unions. The street railway men met on Monday and car service was resumed the same afternoon. The electrical workers met on Monday night but refused to carry out the recommendations of their executive and demanded the dismissal of the superintendent immediately.

The arbitrary attitude of the electrical workers is without precedent in this part of the country. We believe that they will be censured without exception for their deliberate attempt to tie up the life of Vancouver and district when they shut down all electrical supply without warning or notice on the morning of July 14.

The Whole Affair a Matter of Public Concern

This has ceased to be a matter between the British Columbia Electric Railway and the employes. It is a matter for the public to settle—whether they will allow any person or body of persons to close down such essential services as electric light and power without a moment's notice and without responsibility for the consequences. The men may have the right to cease work but they have not the right to tamper with the company's property, thereby inconveniencing thousands of persons and causing possible destruction of property and perhaps death.

It is hard to see what good could have resulted from such action which affected the public and not the company. The public is well aware who is to blame and there is no disposition to saddle this disruption of public utility service on any but the men. Whatever grievances the men might have had, we consider that they were not warranted for a moment in pulling the switches and plunging the country into darkness without notice, but should have laid them before the company, when they would have been given fair consideration.

AMERICAN BANKS IN FOREIGN COUNTRIES

BY JOHN CLAUSEN

There has been much discussion regarding the financial assistance available for American traders in their relations with foreign countries, and to those who take a far-sighted view of the situation with the power of perception and intellect, it appears that we as a nation are still inclined to pride ourselves upon our isolation and ability for self-sufficiency in thought.

No measure has been of greater importance, as affecting not merely the local financial conditions in the United States but the entire situation from an international standpoint, than the Federal Reserve Act. Its facilities for branch-banking in foreign countries especially afford a great improvement of system in our local and international relations, likely to give the United States greater power in foreign trade.

The New Bank Act is essentially intended—as a Commercial Banking System — to assist in the financing of our domestic and foreign trade and provide a market for Commercial Acceptances based upon the importation and exportation of goods. Such instruments, executed to cover specific purchases of commodities which are to be converted into cash during the life of the document, will tend to create a basic condition for automatic recording of commercial operations—an inherent factor to prevent overextension of credit. In the case of Time Bills of Exchange drawn on and accepted by banks or bankers of high standing, there is practical uniformity of security—not readily claimed when considering "Commercial Paper" with which the financial markets here are supplied—in that the strength of such obligations are based upon the standing of approved commercial interests.

The superiority of the Trade Acceptance over the Open Book Account for the purchase or sale of goods—its power to broaden the buying field for the merchant and enable the seller to handle his business at a smaller operation cost—is becoming more and more apparent to all interests alike. Whether that feature with us in business and banking will show a development of as huge dimensions as it has in Europe or take a secondary position, remains a matter of conjecture.

THE STABILITY FACTOR IN MULTIPLE ARCH DESIGN

BY L. R. JORGENSEN

(How to compute the stability of the multiple-arch design is here set forth by the author who has chosen a numeral illustration taken from his extensive notes on the practical application of this formula to actual design in the West. A wider dissemination of calculations such as these should prove helpful in evolving still more thoroughness in fundamentals so necessary in the practice of the consulting engineer in the West where dam construction is becoming of increasing importance.—The Editor.)

The Stability of the Multiple Arch Dam

After the buttresses have been given some preliminary dimensions the stability of the whole structure can most conveniently be investigated graphically as shown in the diagram representing a section through the crown of the arch. To facilitate the investigation the dam is divided up into horizontal sections 10 feet apart in elevation, and the forces

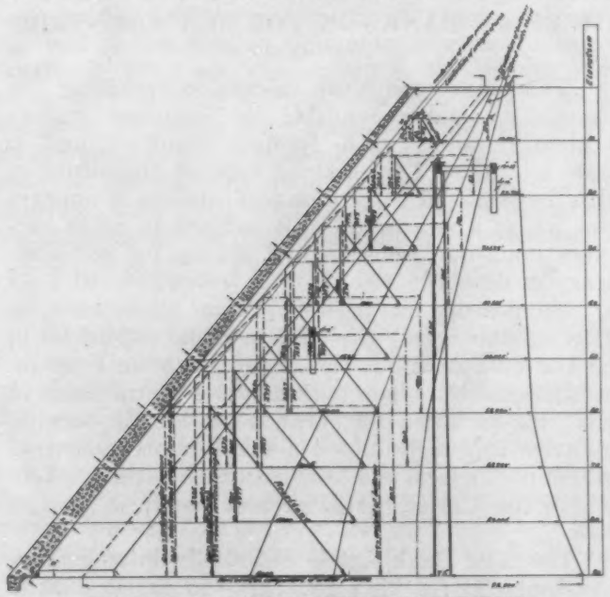


DIAGRAM OF FORCES ACTING ON BUTTRESS

Here is a diagram of a fifty degree buttress with forty foot centers given in tons, and which shows graphically the forces acting on the buttress.

acting on and above each section are shown to scale in the location and direction in which they act.

The most important force acting on the structure is the water pressure. This force is, as usual, assumed concentrated in a horizontal plane, located two-thirds of the total length below the water surface.

The horizontal plane in which the water pressure is assumed concentrated intersects the upstream face along an elliptical curve. The point of application of a single force representing the water pressure does not penetrate the upstream face skin, such as plastering, etc.

Due to the fact that the arches have been given a slope of 50° with the horizontal, the water pressure will have a vertical component =

$$\frac{\text{Horizontal Component}}{\text{tg } 50°}$$

The stability of the dam depends to a very great extent upon the presence and action of this component, as it tends to hold the structure firmly down upon its foundation.

The point of application of the water pressure is, as already stated, taken at the center of gravity of the ellipse. From the crown this is located a little over one-third the total distance (1/3 + 5% for present conditions) between the crown and springing line.

Considering first the upper 10 feet of the dam, the horizontal plane in which the water pressure can be assumed concentrated is at a distance of $2/3 \times 10$ from elevation 0 downward with the water surface at elevation 0, and the point of application "a" of the single force is $(1/3 + 5/100) \dfrac{11.55}{\sin 50°} = 5.78$ ft. from the crown measured horizontally.

The horizontal water pressure due to the 10 feet of water on the 40 foot span is $\dfrac{0 + 625}{2} \times 10 \times 40$ = 125,000 lbs. or 62.5 tons. The vertical water pressure is equal to $\dfrac{62.5}{\text{tg } 50°} = 52.5$ tons. This latter force is now combined with the portion of the weight of the arch acting vertically. The weight of the arch above elevation 10 is equal to its volume in cubic feet times the weight of one cubic foot. The center of gravity of the section—a trapezoid—is found, and the center of gravity "b" of the whole arch is then taken to concide with the center of gravity of an ellipse through the center of gravity of the section in the same manner as explained above for the water pressure. The weight of the arch is now combined with the vertical component of the water pressure and the location of their resultant is found by taking moments around either point "a" or "b." The numerical value of the resultant is equal to the sum of the two forces $52 + 52.5 = 104.5$ tons. Taking moments around "a" and scaling the distances, preferably on the sloping line between "a" and "b" for greater accuracy, we have the equation

$$\frac{52 \times 2.75}{104.5} = X = 1.367 \text{ ft.},$$

giving the location of the resultant at a point 1.367 ft. from "a" along the line between "a" and "b." The weight of the buttresses (above elevation 10) assumed concentrated in the center of gravity "d" is calculated to be 14.5 tons; it is combined with the vertical load on the arch of 104.5 tons in the same manner as shown above by taking moments around any point, say "c." The location of the resultant is found to be at "e," and the value of the same is

$104.5 + 14.5 = 119$ tons. This represents the total vertical force both as to size and location.

This force is now combined with the horizontal water pressure of 62.5 tons and the resultant drawn. It is the purpose of the diagram in this article to give the value of the resultant of all forces and to establish the point of intersection "g" between this resultant and the base, in this case at elevation 10. For convenience the distance from e to f representing the total vertical force of 119 tons may be measured, and the distance f-g representing the 62.5 tons horizontal water pressure set off on the base to the same scale.

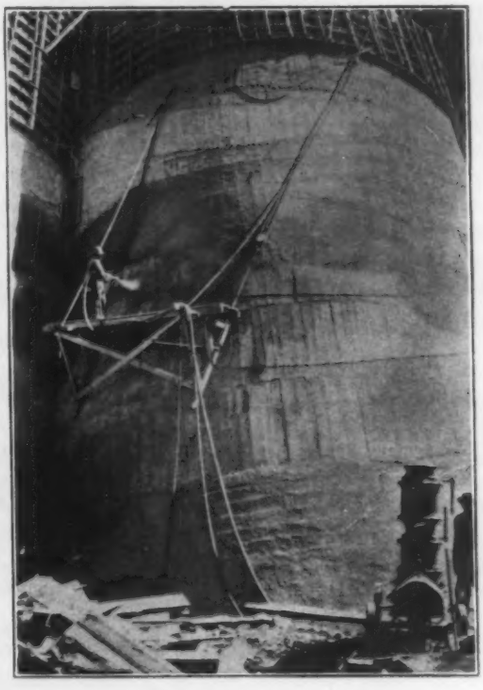
Considering next the portion of the dam above elevation 20 as a whole, the place of application of the concentrated water pressure is located at a distance of $2/3 \times 20$ ft. below elevation O, and the point of application of a single force representing the water pressure on the 40 ft. span is located the same as before, 5.78 ft. from the crown towards the springing line, measured horizontally. The vertical component of the water pressure =

$$\frac{\text{horizontal component}}{\text{tg } 50^\circ}$$

acting on the arch between elevation 0 and elevation 20 and its resultant drawn in the correct location, found by taking moments as shown above. This resultant is again combined with the weight of the portion of the buttress lying between elevation 0 and elevation 20. The shape of the buttress is taken as that of an obelisk, and its volume and the location of the center of gravity is found from ordinary rules applying to such bodies. The weight of the struts and counterforts are to be added to the weight of the buttress, whereby the location of the center of gravity might be slightly changed.

The resultant of all vertical forces acting on the dam above elevation 20 can now be found, both as to size and location, and combined with the horizontal water pressure, whereby the point of intersection of the resultant with the base at elevation 20 is determined.

The same method of procedure is followed out for the remaining portion of the dam, taking each time the base 10 feet lower than in the preceding calculations, and the whole stress diagram is completed. If now the centerline of the buttress, and also the two lines representing the middle thirds, are drawn, this diagram will point out very clearly whether the load is distributed economically on the buttress or not. For maximum economy, the resultant of all forces should intersect the base in the centerline of the buttress, then the load will be uniformly distributed over the whole base. Towards the top this is not quite possible, and is not important, as the material here cannot be stressed very highly at any rate, but towards lower elevations the downstream slope of the buttress should be shaped such as to conform with this condition, viz: The resultant intersecting the base in the centerline, or approximately in the centerline of the buttress. The total vertical load on the section shown in the diagram is 6332 tons, and the horizontal water pressure 5062 tons, both on a 40 foot span. If the coefficient of friction is taken at 0.75 it is seen that the actual shear along the base amounts to only $5062 - 6332 \times 0.75 = 313$ tons. There is considerable steel in the section to help take up this shear, and therefore it was not deemed necessary to eliminate the shear entirely. There is no hydrostatic uplift to amount to anything acting on this type of dam, and water could hardly find its way to lubricate the surfaces of possible cracks in the buttresses. Wherever it would be desirable to eliminate the shear entirely, the face slope should be made more at, say 45°, instead of 50°. This, of course, adds to the material required for construction, but it is the cheapest and best way of accomplishing the result.



THE AGNEW DAM AND A CEMENT GUN IN OPERATION ON AN ARCH OF THE GEM LAKE DAM

Here are two typical multiple arch dams in California that illustrate the method of design set forth in this article. The largest of the two dams is the one at Gem Lake, and consists of sixteen full arches and two fractions at the ends. Each arch has a span of 40 ft. The height of the dam is 84 ft. to a point where arch action ceases, but the foundation extends down 112 ft. below the crest.

THE RATE OF RETURN UNDER PUBLIC REGULATION

BY C. E. GRUNSKY

(The determination of the rate of return which should be allowed public utility companies is based on the same principles as the figuring of profits for unregulated concerns. In the case of regulation, however, the public assumes some responsibility to guarantee a minimum as they limit a maximum return. Recent developments in the Spring Valley rate case of San Francisco involve interesting principles.—The Editor.)

The Obligation of the Public When it Regulates

The public has the right, now hardly questioned, to regulate rates, and thereby to limit the rate of return of the public utility. It has already been stated that the extension of this power of regulation to the affairs of persons and corporations whose business has grown to such proportions that they can crush their smaller competitors, is fast coming to be recognized as desirable. But when this power is exercised whether over the public utility, or over trusts and corporations of monopolistic tendencies, the question may be asked, as already intimated, whether or not the limitation of earnings should not be accompanied by some measure of guarantee that there will be adequate earnings, either for a definite period of time, or for time without limit. Probably no one has yet gone quite so far as to hold that it would be fundamentally sound when rates are regulated by public authority to guarantee a lower limit of net earnings; and yet this is the logical outcome of regulation. If such a practice could obtain the true agency relation would be established. The utility owner would then, in fact, be the agent of the community which the utility serves, and therefore entitled to nothing for risk, nor for unearned increment, but only to the ordinary return on safe investment plus compensations for management. The latter in such a case might be reasonably placed at 2 to 5 per cent of the volume of business according to whether this volume is large or small. This does not mean that a guaranteed rate of return could be made the same in all parts of the country and for all utilities. There would always be considerable range in the degree of security afforded by government or municipal guarantees of rates of return and then, too, the rates of return on safe investments are not everywhere and under all circumstances the same. It might also make a difference whether an enterprise is already profitable or whether it depends for profit on future earnings; whether it is certain to be ultimately successful or whether there remains a doubt concerning the wisdom of having afforded to it the government or community backing. And then the question will arise, whether efficient service can be hoped for if the element of risk is entirely removd. Would not this lead to carelessness and indifference to the disadvantage of the public?

Regulation then should not go too far, the limit of earnings should not be too definitely defined; there should remain the possibility of increasing profits by efficient management.

Rate of Return Illustrations

How the rate of return will vary according to the rate base to which applied can perhaps be shown to advantage by examples.

Let it be supposed that the business of a utility is under consideration to which the following facts apply:—

Investment (determined from cost and from the estimated reproduction cost)	$1,000,000
Accrued depreciation	200,000
Investment less accrued depreciation	800,000
Past amortization of capital	uncertain
Operating expenses (including the current replacement requirement)	250,000
Gross annual income	350,000
Net annual income	100,000
Rate of return applied to value as it would be found if all properties were new	8%
Capitalization of net income, 100,000 at 8%	1,250,000
Present value, 1,250,000 — 200,000	1,050,000
Going value, 1,050,000 — 800,000	250,000

The 'going value' as here listed is the excess of the value of the 'going concern' $1,050,000 over the original investment less depreciation $800,000. If the enterprise were new the comparison would be with another in exactly the same condition ready to begin business but not yet in operation and the result would be found. Going value is, therefore, independent of accrued depreciation.

If money, borrowed for investment on this enterprise can be had at 6% interest, the owners will be getting $8\% - 6\% = 2\%$ on the original investment for management, risk, etc. which is $20,000.

When, for such a a concern, rates are to be fixed, the gross income, the net income and the value are all unknown quantities. The procedure should then be about as follows:

Required earnings:	
8% on the original investment of $1,000,000	80,000
Operating expenses	$250,000
Allowance for management about 2.5% and and for risk and profit about 3% of the volume of business, say	20,000
Total required earnings	$350,000

The allowance here noted of $20,000 for management, risk and profit capitalized at 8% is $250,000. This will be the 'going value' of the business created by such earnings.

The natural rate base in this illustration is $100,000, representing investment not diminished by depreciation. If the net return be compared with this rate base, the rate of return is found to be 10%. In fixing rates, it is undesirable to use this relation because there is included therein, profit and compensation for management and an allowance for risk which as explained should be brought into relation to volume of business. It may be repeated that such comparison with volume of business is preferable to a possible alternative, a comparison with the cost of operation, for the same reason that the merchant desires to express the profit in his sales in percentage of his receipts, rather than in relation to cost. This is no doubt due to the fact that the sale price is more stable and subject to less fluctuation than cost.

As a second illustration, let it be supposed that the following facts relating to a steamboat business

have been ascertained:—

The steamboat cost new and can be replaced for.....	$500,000
Its present value is appraised at.....	100,000
There are invested in other items connected with the business, lands, buildings, wharves, etc. original cost	500,000
The present value of these other items is.....	300,000
The mean annual dependable gross receipts are.....	450,000
The operating expenses per annum including a fair replacement increment, are.....	250,000
The net return, therefore.....	200,000
The rate of return on the value of this business as value would be found if all properties were new, should be, per annum.....	15%
What is the value of the business?	
What is the value of the good-will? or in case of a public utility and no competition, what is the 'going value?'	

If the steamboat were new the value of the business would be found by capitalizing the net earnings ($450,000 — $250,000 =) $200,000 at 15 per cent. This would make the business worth $1,330,000. But as there remains only $100,000 of the original value of the steamboat to be made good before the steamboat will have to be replaced and this is $400,000 short of the cost of a new steamboat, and because the other properties connected with the business have decreased in value $200,000 (supposed in this case to have been covered by past earnings) the present value of the business will fall ($400,000 + $200,000 =) $600,000 short of the value that would obtain if all the properties including the steamboat were new. Consequently the value of the property is $1,330,000 — $600,000 = $7730,000.

Purchased at this price the new owner would apparently be earning $200,000 annually on an investment of $730,000. His rate of return would appear to be 27.4 per cent on this investment. But he has assumed an obligation to re-invest in a new steamboat when the old one fails at which time he will have earned only $100,000 toward the cost of this steamboat. He has also assumed the obligation to keep in repair and at full efficiency, buildings and wharves which are no longer new and whose up-keep will cost more than if they were all new. He will have assumed all the obligations that went with the original investment of $1,000,000 and can not afford to pay more than the $730,000 for the business without consenting to a rate of return on such investments less than the assumed $15% rate.

The 'good-will' or 'going value' of the business as the case may be, is found by comparing the investment in the business with the value thereof, all properties being assumed new (or by comparing present value with the investment decreased by accrued depreciation). In this case it will be $1,330,000 — $1,000,000 = $330,000, or $730,000 — $400,000 = $330,000.

If now it is possible to borrow money for investment in this steamboat enterprise at a cost of 7% per annum and, for the purpose of illustration, it be assumed that the entire original investment of $1,000,000 has been thus borrowed, the owner would have to pay out as interest $70,000 leaving $200,000—$70,000 = $130,000 as his compensation for management, assumption of hazard, and share in general prosperity. This is equivalent to about 30% on the volume of business. This rate is high because the volume of business which has been assumed is small. It should be relatively high because the steamboat business is hazardous.

The rate of return based on the present value is found by comparing the net income of $200,000 with the present value $730,000. It is 27.4%.

What in the case of this steamboat business is the rate of return expressed in relation to the original investment?

The original investment was $1,000,000. This is made up of the value of the physical properties $400,000 plus the obligation to make good the accrued depreciation of $600,000 as required. The net income is $200,000. The rate of return on the original investment, on the natural rate base, is therefore, 20 per cent per annum.

What in the case of the same property is the rate of return expressed in relation to the investment decreased by accrued depreciation—i. e., relative to the so-called depreciated or present value without inclusion of going value?

As the original investment was $1,000,000 and the accrued depreciation is $600,000 the present value, exclusive of 'going value' is $400,000 and the rate of return on this basis 50% per annum.

These illustrations make plain the proposition that the rate of return varies according to the base to which applied without affecting the essential element, the net earnings.

The Spring Valley Water Co. Rate Base

On the subject of the fair rate of return in the Spring Valley Water Company rate case,* the standing Master in Chancery, Mr. H. M. Wright, in his report filed with the court in October, 1917, says:

> "What we desire to determine is the fair rate of return which the capital already invested and in fixed form in plaintiff's properties was entitled to earn in the different years in question as a reward for its dedication to the public service. The usual test for determining that fair rate is,—what rate of return would in any such year attract new capital to an investment in plaintiff's property to provide additions or extensions thereto. I presume the theory is that the existing investor should receive at any time for the use of his capital already in the enterprise whatever a new investor would demand in return for new capital put in alongside the existing capital,—or, otherwise expressed, the current market rate of money for this purpose. The point of view seems to me correct and helpful and if I mistake not is acceded to by counsel for both parties."
>
> "It is the plaintiff's position that a showing of less than 7% per annum net return is less than a reasonable rate. It is the city's position that 5% is 'non-confiscatory' or, in other words, reasonable; it is not in terms conceded that less than 5% is unreasonable."

In the case of Willcox vs. Consolidated Gas Co. (212 U. S. 19) the U. S. Supreme Court says in referring to factors which influence the rate of return:

> "The amount of risk in the business is a most important factor, as well as the locality where the business is conducted, and the rate expected and usually realized thereupon, investments of a somewhat similar nature with regard to the risk attending them. * * * The less risk, the less right to any unusual returns upon the investments."

After stating that in the case of the Consolidated Gas Company the risk was "reduced almost to a minimum, because future competition was 'unthinkable'" and that its business was "the most favorably situated gas business in America," the Court says:

> "Taking all facts into consideration, we concur with the court below on this question, and think complainant is entitled to 6% on the fair value of its property devoted to the public use."

*Spring Valley Water Co. vs. San Francisco (rate case).

The Master in the Spring Valley Water Company rate case, after stating that this rate of return applies to New York in 1906, reaches the conclusion that under the different circumstances, particularly as to the risks involved and the difference in the money markets and rates of New York and San Francisco, "a higher rate would be proper for this plaintiff in 1907-15" if 6% was a proper rate for the Consolidated Gas Company in New York in 1906. The Master then reviews earlier decisions in water rate cases in California showing rates of return heretofore allowed and also the rates of return on real estate loans and on stocks and bonds, and cites the testimony of expert witnesses and reaches the conclusion:

"That the fair rate of return, net, which plaintiff was entitled to earn during the period 1907 to 1915 inclusive, for the service of '(supplying)' water to San Francisco and its people, was seven per cent per annum upon the property values as found in this report. And if the court shall conclude that a sum for going value should not be included in the appraisal of capital in use, so that the works is valued practically as a new enterprise, then I find the fair rate to be applied was eight per cent."

The Master in reaching this conclusion follows the usual practice of bringing the entire net earnings into a percentage relation to the property values instead of making a subdivision thereof, as the writer points out would be more logical. The result would be practically the same, for example, in the case of a public utility valued at $30,000,000, whose operating expenses are $1,200,000 per annum when earnings are to be limited, whether the net income be computed at 6% on $30,000,000, plus an allowance of 10% on the gross income of about $3,300,000 amounting to ($1,800,000 + $330,000 =) $2,130,000, or whether the same be computed at a 7% rate of return amounting to $2,100,000. The desirability of the first of these methods of determining the net income to be allowed, under which some regard is had to the volume of business as well as to the natural rate base, has been fully discussed in a preceding article of this series.

SYSTEMATIC MAINTENANCE AS A PREVENTIVE FOR EQUIPMENT TROUBLES

BY J. S. DEAN

For the same reason that a physician prescribes a tonic to build up a run-down patient's system in order to fortify and strengthen it to better withstand changes in severe weather and physical conditions, railway operating men are becoming more and more convinced that railway equipments should receive similar treatment at stated intervals as a preparedness measure to enable their cars to weather unusual operating conditions encountered from time to time. To carry this simile farther, some free-thinkers have advanced this idea still further by suggesting that doctors be paid for keeping a man well, rather than to receive a fee for attending him when the breakdown occurs. This same thought is applicable to the care of railway equipment as it is considered by far to be better practice to spend comparatively little money in preparation by systematic inspection and overhauling rather than to wait for a complete breakdown with its increased expense, not to mention the scarcity of cars at the time when most needed.

While the memory of last winter's experience is still fresh in the minds of most operating men, it seems to be a very appropriate time to impress upon them the importance of applying a tonic in the form of a general overhauling to their rundown equipment to meet the emergency of the coming winter season. Apropos to the above, we would mention a few of the salient points that should be brought to their attention at this time. These are as follows:

1—Shop Organization. A most important factor in handling the work of a street railway company efficiently is to have a well organized body of men headed by a competent master mechanic.

2—Inspection. This work should be done at regular stated intervals of time, or on a mileage basis under the supervision of reliable and trained sub-foremen.

3—Records. To intelligently supervise the work, as outlined by the shop organization, accurate and reliable records should be kept of troubles, repairs, life of parts, mileages, costs, etc.

4—Dipping and Baking. During the repair and overhauling of the motors, special emphasis should be placed on the importance of dipping and baking the field coils and armatures to insure against moisture and defective insulation.

5—Painting Inside of Motors. The inside of motor frames, after all dirt is cleaned out, should be well painted with a heavy asphaltum paint.

6—Motor Leads. The motor leads should be well cleared to prevent rubbing and chafing and consequent grounding, also given a thorough painting to make them moisture proof as far as possible.

7—Car Wiring. All car wiring, unprotected, should be well cleated and painted with a heavy asphaltum paint.

8—Motor Covers. Suitable tight-fitting commutator, hand-hole, armature and axle bearing covers should be provided and used as a means to keep snow and water from entering all parts of the motors.

9—Motor Drain Holes. These openings should be kept clear to allow for proper drainage of water from the motor frame.

10—Gear Cases. Gear cases should be overhauled and made to clamp securely to gear case support. The two halves should be so fitted together to keep out snow and water.

11—Detail Apparatus. These should be thoroughly overhauled and all windings and cables painted with a good grade of asphaltum paint. Suitable covers and guards should be provided to protect them from water and snow.

12—Available Spare Parts. It is considered good practice to keep an available supply of spare parts of all apparatus on hand to meet emergencies.

13—Snow-Fighting Apparatus. Careful inventory of this apparatus should be made and same put in good working condition.

With the air thoroughly saturated with the spirit of preparedness, we believe it is a very opportune time for us to drive home the truthfulness of the old adage, "An ounce of prevention is worth a pound of cure."

PROGRAM OF POWER PLANT SAVING

(In the June issue of the Journal of Electricity the Fuel Oil Pledge Cards were reproduced. It will be of interest to our readers to know that this campaign is nation wide as reported below. The power plant pledges in use in California are also given as samples of the effective work which is being carried on under local direction.—The Editor.)

State Administrative Engineers of the United States Fuel Administration held a conference in Washington on June 28 and 29, discussing the plan of organization in connection with conservation of fuel in power plants throughout the United States. The engineers appointed to date are:

Thomas R. Brown, Pittsburg, for western half of Pennsylvania; formerly special engineer of Westinghouse Air Brake Company.

George R. Henderson, Philadelphia, for eastern half of Pennsylvania; formerly consulting engineer of Baldwin Locomotive Works.

Edward N. Trump, New York City, for state of New York; vice-president of Solvay Process Company.

W. R. C. Corson, Hartford, for New England; secretary, Hartford Steam Boiler Insurance Company.

Charles A. Cahill, Milwaukee, for Wisconsin.

Others at the conference were: M. S. Hopkins, Columbus, Ohio; O. P. Hood, Bureau of Mines, Pittsburg; Prof. L. P. Breckenridge, Yale University; H. H. Stock, University of Illinois.

The national program will extend into all states east of the Mississippi, and include Louisiana, Missouri, and Minnesota. An administrative engineer will be appointed for each of the states in the area mentioned.

This plan is the result of conferences with the Federal Administrators and their committees for the group of states which together consume about seventy per cent of all coal used in the United States, exclusive of railroads. The plan has received the endorsement of all of these states, as well as approval by the United States Bureau of Mines and the Committee of Consulting Engineers on Conservation and Publicity, which represents the Engineering Council of the four National Engineering Societies.

The slogan of the campaign is "Maximum production with minimum waste." The object is to operate all industries at full capacity, but to make every pound of fuel perform maximum service.

In laying the foundations for the organization it has been anticipated that this work should become a permanent service of the Government.

Ten to twenty per cent, that is, from twenty-five to fifty million tons of coal per year, can be saved by correct operation of steam power plants, using their present equipment, and without installation of new apparatus.

It is considered most important that all existing fuel conservation committees, committees of Chambers of Commerce and National Defense, Manufacturers Associations and other bodies be continued in full force, and that the cooperation of such organizations be obtained.

The administrative engineer in each state will work under the supervision of the present Federal Administrator. No separate or new organization is contemplated, but sufficient addition to the working force in each state will be made to insure efficient execution of the new function.

The National plan comprises certain fundamentals, as follows:

1. Personal inspection of every power plant in the country.
2. Classification and rating of every power plant, based upon the thoroughness with which owner of said plant conforms to recommendations.
3. Responsibility of rating the plants will fall upon the Administrative Engineer in each state; the rating to be based upon reports of inspectors, who will not express opinions, but will collect definite information. The State Fuel Administrator in his judgment may entirely or partially shut off the supply of coal to any needlessly wasteful plant in his territory.
4. Inspectors are to be furnished from one or more of the following sources:
   - A—Inspectors of the steam boiler insurance companies.
   - B—State factory inspectors.
   - C—Engineering students from technical colleges.
   - D—Volunteers and others .

The ratings will be used upon recorded answers to questions, each of which will be given a value depending upon its relative importance to the other questions. Depending upon the efficiency of methods in use in any plant, it may be rated in Class 1, 2, 3, or 4.

The Administrative Engineer in each state will have supervision of electrical and mechanical problems connected with fuel conservation activities contemplated under this plan.

The ratings will be based upon existing equipment. The difficulty, delay and expense involved in the installation at this time of improved power equipment is fully recognized; but experience has proved that ten to twenty per cent of fuel now used in power plants can be saved by improvements in operation alone.

In advance of the first inspection a questionnaire is being sent to every power plant in each district, with notice to the owner that within, say sixty days, his plant will be inspected personally, and the questionnaire will be checked up by the inspector upon his visit. This action will give a reasonable time to any plant and conform to recommendations before his plant is actually rated. Thus, when the inspector calls for the purpose of obtaining and checking up the information form, the plant may receive a much higher rating than would have been the case if no time were allowed between the sending and collecting of the questionnaire.

It is recommended that a board of competent engineers be attached to the conservation committee in each state, also a corps of lecturers to arouse public interest and disseminate engineering information.

The Fuel Administration has prepared a fifty-minute film of moving pictures showing good and bad operation in the steam boiler plant, methods of testing boilers, etc. These pictures will be available to each state in connection with its educational propaganda.

The Administration is also preparing a series of official bulletins on engineering phases of steam and

fuel economics. Some of these are now ready for printing. They will include:

1—Boiler and Furnace Testing.
2—Flue Gas Analysis.
3—Saving Steam in Heating Systems.
4—Boiler Room Accounting Systems.
5—Saving Steam and Fuel in Industrial Plants.
6—Burning Fine Sizes of Anthracite.
7—Boiler Water Treatment.
8—Oil Burning.
9—Stoker Operation.

In addition to this service, a list has been prepared in Washington of competent engineers for each local administration. As the work develops, still further constructive assistance is contemplated for helping owners to bring their plants up to a high plane of economic operation.

PLEDGE CARD FOR PUMPING PLANTS USING ELECTRIC POWER

The following pledge is asked of owners and operators of pumping plants in California using fuel oil:

I am glad to join you in fuel conservation for our Nation and I hereby accept membership in the United States Fuel Administration, pledging myself to carry out to the very best of my ability the following directions and advice:

Pledge

1. To operate plants only between the hours of 6 p.m. and 8 a.m. in so far as it is possible to do so, avoiding operation between 8 a.m. and 6 p.m.

2. To keep plants in efficient condition, thus avoiding waste of power. The great loss generally occurs as a result of:

(a) Improper speed for the head pumped against.
(b) Leakage of air through loose shifting boxes.
(c) Loose and slipping belts.
(d) Improper adjustment of pumps or other equipment.

3. To open transformer switches when plants are not in operation, thus saving power ordinarily wasted as transformer losses.

4. To avoid unnecessary operation of plants.

5. To see that water is not wasted by careless or inefficient distribution.

6. To make every other reasonable effort to save power.

7. To cooperate with the Power Company in this patriotic campaign by calling on its nearest representative for information and advice.

There are no dues or fees to be paid. The Fuel Administration wishes to have as members all of those who pump by means of electric power.

You do a patriotic duty by signing this pledge.

Signed, Name of Plant Owner.
Address.
Name of Operator.
Address.

This is printed on a card, the reverse side of which is shown below. In addition to the pledge, the owners of all such plants are asked to submit names of their employes to whom similar cards may be sent.

THE ELECTRIC LIGHT AND THE ELECTRIC APPLIANCE IN FUEL CONSERVATION

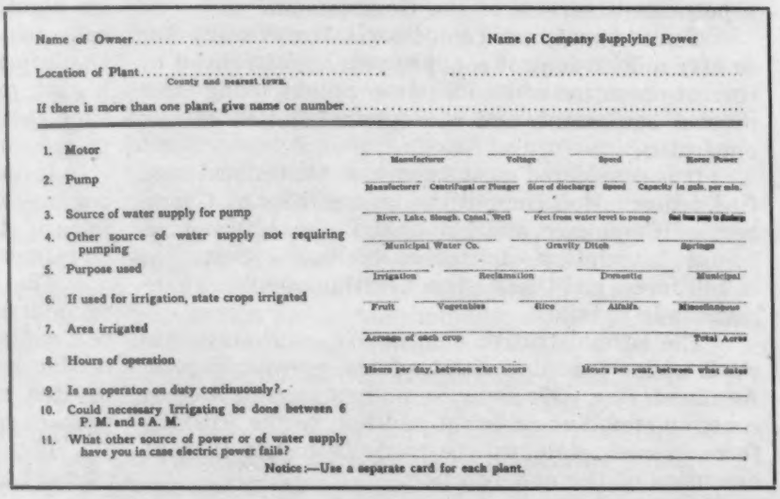
Data recently collected in a nation wide canvass goes to show that electric lighting is responsible for only 1% of the coal consumption of the United States. A very small portion of this is used for domestic lighting—far the larger percentage being for street lighting, industrial lighting, sign and display lighting, store lighting and the illumination of public buildings.

The output of electricity last year was 27,000,000,000 kilowatt hours. Over one-half of this was produced by water power and quite a percentage by the use of oil.

The receipts from the sale of energy by electric companies was about $470,000,000 or about 1¾c per kilowatt hour. The average price received for lighting is about 8½c per kilowatt hour. Many of the central stations receive from 10 to even 18c and over per hk-hr. for domestic service. In spite of this price for electric current for domestic lighting, many central stations find the amount used under normal conditions by the household is so small that it does not give an adequate return for the service.

For instance, one of the Southern companies with 19,000 customers has 9,000 who pay $1 or less

The accompanying card is that used by the Fuel Administration in California for the encouragement of conservation ideals in individual pumping plants. The pledge is that of the operator and its text as given above is printed across the other side of the card. The cards with the data are then filed away in the administration office and used in the later survey and tour of personal instruction.



Name of Owner..... Name of Company Supplying Power

Location of Plant..... (County and nearest town.)

If there is more than one plant, give name or number.....

1. Motor — Manufacturer — Voltage — Speed — Horse Power
2. Pump — Manufacturer — Centrifugal or Plunger — Size of discharge — Speed — Capacity in gals. per min.
3. Source of water supply for pump — River, Lake, Slough, Canal, Well — Feet from water level to pump — Gal. raised per min. to discharge
4. Other source of water supply not requiring pumping — Municipal Water Co. — Gravity Ditch — Springs
5. Purpose used — Irrigation — Reclamation — Domestic — Municipal
6. If used for irrigation, state crops irrigated — Fruit — Vegetables — Rice — Alfalfa — Miscellaneous
7. Area irrigated — Acreage of each crop — Total Acres
8. Hours of operation — Hours per day, between what hours — Hours per year, between what dates
9. Is an operator on duty continuously?
10. Could necessary Irrigating be done between 6 P. M. and 8 A. M.
11. What other source of power or of water supply have you in case electric power fails?

Notice:—Use a separate card for each plant.

a month and of this number 5,000 pay about 50c or less. Even in normal times, the cost of meter reading, billing and collecting and the expense of the service in the house itself is in excess of 50c a month, so that customers paying this amount or less are receiving their current for nothing as this 50c does not include the cost of generating the electricity.

If an effort is to be made to restrict the use of electricity in the home this condition would be aggravated and without any appreciable effect on the coal consumption of the country. A far greater waste of coal is due to the steam power plants in factories and shops.

In tests made on such plants in Colorado recently, it was found that from 12 to 18 lbs. of coal were required to produce a horsepower hour. The larger electric central stations are now producing a kilowatt hour which, as you know, is considerably in excess of the horsepower hour, with an expenditure of 2 lbs. of coal per kilowatt hour. Furthermore, the increased expenditure of labor in delivery of coal to the small plants is very appreciable. It is difficult enough for the Fuel Administration at present to insure delivery of coal to the large central station in each community. Difficulties are multiplied to provide coal for innumerable small consumers.

Instead of the attitude looking toward the restriction of lighting in homes, there should be encouragement of greater consumption of electricity in the home, even to the extent of favoring the introduction of labor saving devices, such as washing machines and cooking appliances—either the range or small grills, toasters, percolators, etc.

The average coal range consumes anywhere from 6 to 10 tons of coal a year, if the fire is carried through the night and if it is rebuilt every day more fuel is wasted in wood necessary to start it.

The current consumption of the electric range, based on over 25,000 ranges in all parts of the country, averages 125 kilowatt hours per month or 1500 a year. Assuming a consumption of even 4 lbs. of coal per kilowatt hour for the electric range, this means only 3 short tons of the low grade coal which the Central Station can use as against two or three times this amount of anthracite in the domestic coal range.

WHAT WESTERN INVENTORS ARE DOING

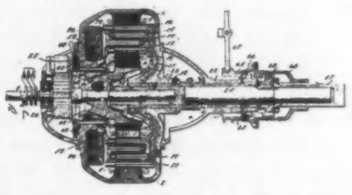
BY WM. K. WHITE AND H. G. PROST

(Several new suggestions which may develop into worth while improvements. A new power transmitting apparatus which permits the movement of the field element in either the same or in the opposite direction to the armature. A readily adjustable wrench which should prove useful in line work and a new electric water heater together with mention of other recent inventions.—The Editor.)

Electro Magnetic Power Transmitting Apparatus

Patent No. 1,266,303, issued to Alfons H. Neuland, of San Francisco, California, discloses a novel form of electro magnetic power transmitting apparatus. An object of the invention is to provide a power transmitting apparatus in which the driven member may rotate at a different angular velocity than the driving member and in which the speed of the driven member may be varied with relation to the speed of the driving member. The speed of the driving member may be maintained constant at the most efficient speed of the prime mover, and the speed of the driven element may be varied from zero to synchronism with the driving element or above the speed of the driving element, and this may be accomplished without dissipating the energy in external resistances and the like. A further object of this invention is to provide a power transmitting apparatus in which the direction of rotation of the driven element may be reversed with relation to the direction of rotation of the driving element.

Generally speaking, the present invention consists in one of its phases in producing a torque between an armature and a field element and allowing the torque to move the field element either in the same or in the opposite direction to the armature. The armature is connected to either the driving or the driven shaft and the field element is connected to the other shaft. The torque and slip are dependent on the strength of the field, the current in the armature and the power factor of the armature current, and a variation in the torque and slip is obtained by varying either the field current or the resistance of the armature circuit or both. The apparatus consists of a field element, including two independently rotatable inductors, cooperative by their relative rotation, to produce a revolving flux path. Means are provided for locking one of the inductors against rotation, so that the rotatable force is applied only to the other inductor, which is secured to either the driven or the driving shaft. The armature is secured to the other shaft, either the driving or the driven shaft, and means are provided for producing a magnetic flux cutting the armature and the field elements. The field flux in the field element is produced by the magnetizing coil which is arranged adjacent the field element. With the armature rotating, and the armature circuit closed through a resistance or short circuited, a torque is produced between the field element and the armature by reason of



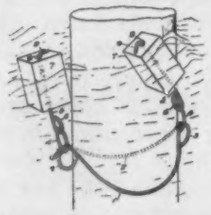
their inductive relations. A high starting torque is obtained by introducing the armature current into a winding arranged on the stator instead of absorbing the armature current in external resistances. As the driven member begins to rotate, the field progresses in the direction of the armature rotation, producing poly-phase currents which circulate through the windings of the stator and create a revolving field, the angular velocity of which equals the angular velocity of the field due to the rotation of the field element. Reversal of direction of rotation of the driven element without reversing the direction of rotation of the driving element is accomplished by

having the field element divided into two members rotatable independently of each other and so constructed and arranged that the torque produced between the field element and the armature current tends to rotate one member in one direction and the other member in the opposite direction.

Pile Cleaner and Protector

Patent No. 1,266,051, issued to Alva L. Reynolds, of Long Beach, California, shows a novel device for removing the marine life from piles. This device consists of a ring formed of two sections loosely jointed together and adapted to loosely encircle a pile.

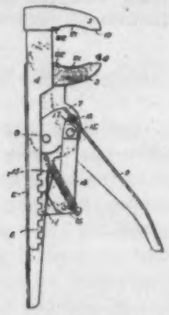
Rectangular floats are connected to the point of jointure of the two sections of rings to cause the rings to move up



and down on the pile with the tide. The ring acts to scrape excrescences from the surface of the pile, and the floats pound against the pile and knock the excrescences therefrom. The two sections of rings ride closely the surface of the pile and operate efficiently to scrape any marine life from the surface of the pile.

Rapidly Adjustable Plier Wrench

Patent No. 1,266,683, issued to William F. Hamrighausen, of San Leandro, California, shows a new form of rapidly adjustable plier wrench. This wrench consists of a body having a fixed jaw thereon. Sliding in the body is a shank carrying on its end a movable jaw which operates in

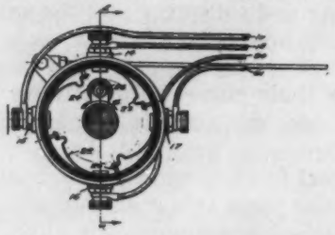


conjunction with the fixed jaw. Pivoted to the body is a handle and fulcrumed to the handle is a dog which has teeth on its lower end which are adapted to engage in teeth on the lower end of the shank. The teeth on the dog are normally held in contact with the teeth on the shank by a spring and by oscillating the handle, the movable jaw is reciprocated.

The dog may be readily removed from engagement with the teeth on the shank by raising the handle slightly and thereby the adjustment of the jaws may be rapidly changed. In gripping a pipe, the jaws may be set in contact with the pipe, and then the handle be pressed to firmly grip the pipe.

Commutator

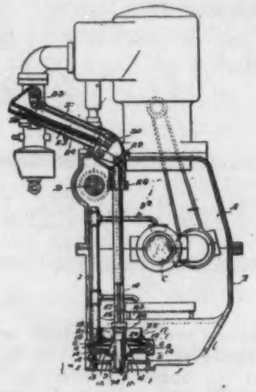
Patent No. 1,266,798, invented by William L. Hallock of Los Angeles, California, shows a novel form of commutator, which is particularly adapted for use in connection with ignition systems for internal combustion engines. The commutator consists of a timing shaft, having an arm secured thereto, and a contact roller arranged at the end of the arm and adapted to move in a circular path. Surrounding the shaft is a casing, having a plurality of resilient contact members preferably formed of heavy wire or sheet metal with which the roller connects as the timing shaft rotates.



The contacts are pressed back by the roller and may be so adjusted that the amount of depression of the contacts by the roller may be great or small.

Combined Speed Governor and Lubricator

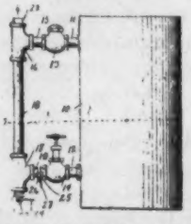
Patent 1,265,713, issued to Gordan C. Pharo, of Marysville, California, and assigned to the Pharo Manufacturing Company, of Bridgeport, Connecticut, shows a combined speed governor and lubricator for internal combustion engines. The device includes a rotary impeller for pumping



oil, and the oil pump is used both for lubrication and for controlling the speed governing mechanism, thereby eliminating the use of the pump. Variations in speed of the impeller cause variations in the oil pressure, and these variations in oil pressure operate the governing mechanism to vary the opening of the valve in the intake manifold, thereby varying the speed of the engine.

Electric Water Heater

Patent No. 1,265,849, issued to Jesse F. Wheelock, of Dobbins, California, shows a new form of electric water heater. This heater consists of a water tank having a column of conductive material rising parallel to the tank and having its upper and lower ends connected to communicate with the interior of the tank. An electric heating element is arranged



within the column and insulated therefrom, and a check-valve is arranged between the upper end of the column and the tank, and a regulating valve is arranged between the lower end of the column and the tank.

The water in the column acts as a conductor between the heating element and the walls of the column, and the quantity of water in the column determines the intensity of the heat. The quantity of water in the column is determined by the regulating valve at the lower end of the column.

SPARKS—Current Facts, Figures and Fancy

(The "Safety First" straw hat—Electrical equipment on German aeroplanes—Our record in past Liberty Loans—Telephone difficulties in China—Community Kitchens—Western spruce production—and a variety of current comment on electricity and the war.—The Editor.)

And here again electricity is helping to win the war. A new illuminated motto has made its appearance on the wall in the office of Chairman Hurley of the Shipping Board in Washington: "Noah was 600 years old before he knew how to build an ark," it says, "Don't lose your grip."

* * *

A list of the twenty-two allies in conjunction with Uncle Sam in his work is as follows: France, Belgium, Japan, China, Rumania, Cuba, Panama, Bolivia, Guatemala, Honduras, Greece, England, Serbia, Italy, Portugal, Montenegro, San Marino, Brazil, Costa Rica, Siberia, San Domingo, Siam.

* * *

A Canadian manufacturer of batteries reports that there is a great demand for this class of goods at present. There is a shortage of help in some plants, and raw materials have been scarce and hard to obtain. One large plant is now working three shifts of eight hours each in order to keep up with the demands.

* * *

The reaping machine won the Civil War for the North. In the future it will be said that the tractor, the gasoline engine, electric power, the milking machine, the automobile, the truck, the cream separator, the manure spreader, modern barn equipment, the binder, the drill—labor-saving machinery, in fact—did their share to defeat autocracy.

* * *

A strict export prohibition now in force in Denmark makes it necessary that every person who travels into Denmark shall upon arrival submit to the customs officers a list of all the wearing apparel which he carries with him, including that with which he is actually clothed. Upon leaving the country this list must be submitted to the customs officers and the traveler will not be permitted to export other articles than are noted on the list.

* * *

The introduction of Western athletics into the orient is part of the awakening of that region. One of the hardest lessons to teach the Chinese in connection with athletics, according to a recent issue of Millard's Review, is that of the spirit of sportsmanship. It was a common thing, a couple of years ago, to see a Chinese athlete, finding himself a few yards behind in a race, suddenly quit. Sometimes a whole team would refuse to finish out a game simply because it was losing.

* * *

Owing to the difficulties of understanding the great number of dialects in use in China, there is considerable difficulty experienced by "Central" in the use of the Chinese telephone. In an address recently made by Mr. Harry S. James before the Engineering Society of China it was recommended therefore that the automatic telephone should be adopted in China as a possible solution of many of the problems encountered in the use of manual telephony in cosmopolitan communities.

* * *

Bonds in $50 and $100 denominations have been sold during the three Liberty Loan campaigns to an aggregate of 25,000,000 subscribers, the total of whose subscriptions amounts to $2,500,000,000. Of the first loan there were 3,000,000 of these small subscriptions; of the second, 8,000,000; of the third, 14,000,000. It has been figured that one in every twenty-seven of the population subscribed to the first loan, one in every eleven and one-half to the second, and one in every seven to the third.

* * *

One gas company in St. Louis has inaugurated a community kitchen in cooperation with the women of the community—an example of patriotism and good advertising which might well appeal to the electric companies. Before long the Committee on Food Conservation hopes to have a string of five such kitchens in operation, one in each of the slum districts. The community kitchens also are used for educational purposes, and it is a common sight to see a housewife getting instruction from the community kitchen cook.

* * *

It has recently been pointed out by a safety engineer that the wearing of straw hats with stiff brims by those employed in and around electrical stations provides a measure of safety. In case the head should accidentally come in contact with live wire, the brim of of the hat or the crown prevents injury and gives the necessary warning. In a recent accident, it is pointed out that where a man unconsciously came in contact with a 13,000-volt line, he would in all probability have been protected had he worn a straw hat with stiff brim instead of a felt hat.

* * *

The electrical equipment of German aeroplanes is reported by a French lieutenant in a recent issue of La Nature. Besides the wireless equipment, for heating purposes the German machines are equipped with electric heaters fed by the wireless generator or by a special generator. Special heating devices are also provided for keeping fluid the lubricating oils for the engine and for the machine guns when machines are flying at a great altitude. The position indicators, instrument lamps, landing signals, etc., are generally supplied by a small generator or from accumulators.

PERSONALS

E. O. Shreve has been named local manager of the General Electric Company at San Francisco. Mr. Shreve has been acting in this capacity with the title of assistant local manager ever since T. E. Bibbins resigned to become president of the Pacific States Electric Company. Mr. Shreve has long been identified with all that is good and helpful in the upbuilding of the electrical industry in the West. His effective work in Nevada first brought his efforts into the limelight. After graduating from Iowa State College and reciving his apprentice work at Schnectady Mr. Shreve came West in 1906 and rapidly became identified with the activities of his company in the West. He passed successively through the stages of salesman at the San Francisco office, manager of the Reno, Nevada office, turbine expert at San Francisco, manager of the supply department at San Francisco, and finally to his splendid new position of manager of the San Francisco office. The fellow engineers of Mr. Shreve recognize in him a man of unusually high ideals and truly constructive effort. The best wishes of the West go with him in his new promotion.

Otto E. Osthoff of the Byllesby Light and Power Company of Chicago, is a recent visitor in San Francisco.

W. A. Leuenberger, manager of the Tacoma Gas Company, Tacoma, Washington, has been elected president of the Tacoma Rotary Club.

A. E. Tregenza, general sales manager of the Economy Fuse Company with headquarters at Chicago, is a recent Pacific Coast visitor.

W. E. Coman, vice-president and general manager of the Northwestern Electric Company of Portland, Ore., spent several days in San Francisco recently.

Glenn C. Kiley, of the rate department of H. M. Byllesby & Company, Chicago, has joined the National Army and will be located for the present at Camp Grant.

J. W. Asher, manager of the Asher Electric Company of San Francisco, is retiring from his work in order to enter into the service of the United States Government.

H. A. Joslin has been transferred from the position of managed of the Eugene office to be manager of the Dallas office of the Oregon Power Company, succeeding R. U. Steelquist.

C. V. Aspinwall, manager of the supply division of the Westinghouse Electric & Manufacturing Company, Seattle, recently returned from Spokane where he spent a week in the interest of the company.

R. H. McKibbin, who has been with the Cerro de Pasco Mining Company at Pachachaca, Peru, for the past year on hydroelectric construction, is now electrical engineer for the Southwest Cotton Company at Phoenix, Ariz.

E. N. Brown, of the Majestic Electric Company with headquarters in San Francisco, has been appointed on the regional branch of the War Industries Board for the coordination of industrial activity on the Pacific Coast.

W. E. Jones, district salesmanager of the Economy Fuse Company, with headquarters at Seattle, is a recent San Francisco visitor and reports business conditions in the Northwest in excellent shape, especially in ship building and in the foreign trade activities.

Philip R. Bradley, of Treadwell, Alaska, succeeds Judge R. A. Gunnison, who died recently, as Federal Food Administrator for Alaska. Mr. Bradley is a graduate of the University of California and is well known in coast cities as a mining engineer.

Harry V. Croll, formerly general sales manager for Traylor Engineering & Manufacturing Company, Allentown, Pennsylvania, has gone to Los Angeles, where he becomes Southwest district manager for the same company. His district covers the entire Southwest.

W. H. Trennier, superintendent of power, Idaho Power Company, Boise, Idaho, and **H. L. Walther,** general superintendent, California-Oregon Power Company, Medford, Oregon, have been named as members of the Hydroelectric and Technical Committee of the Northwest Light and Power Association.

William C. Keefe has been appointed manager of the local office of the Santa Barbara Telephone Company, Santa Barbara, California, to succeed Louis Bienvenu, resigned. Mr. Keefe has been with the Bell company for the past eighteen years, and has for a number of years been connected with the Los Angeles office.

J. L. White, district manager of the Oregon Power Company at Eugene, Oregon, has resigned as chairman of the Public Policy Committee of the Northwest Light & Power Association for Oregon, because he has severed his connection with the public utility industry. No chairman has been named in his stead. **O. B. Frank,** manager of the Douglas County Light & Power Company, at Roseburg, Oregon, has been appointed a member of the committee.

E. C. Jones, chief gas engineer for the Pacific Gas & Electric Company and long a national figure in gas engineering on the Pacific Coast, has been elected chairman of the San Francisco Section of the American Society of Mechanical Engineers for the coming year. The newly elected executive committee that is to assist Mr. Jones consists of: Elvin Stoddard, general manager of Chas. C. Moore & Company; Geo. L. Hurst, mechanical engineer for the Union Iron Works; H. S. Markey, of the Great Western Power Company, and J. H. Hopps, consulting engineer.

E. A. Wilcox, formerly electric range specialist for the Great Western Power Company and more recently manager of the Public Service Company of Oklahoma, Tulsa, Okla., has resigned to accept a commission as captain in the national service and is outfitting for overseas service in the chemical warfare section. Prior to his connection with the Public Service Company of Oklahoma, Mr. Wilcox became well known as a writer through his articles on electric heating that appeared in the columns of the Journal of Electricity and through his authorship of a book on electric heating published by the Technical Publishing Company, publishers of the Journal of Electricity.

Captain F. D. Baker, formerly in charge of the commercial department of the Sierra & San Francisco Power Company, well known in electrical circles of California, who has been stationed at Fort McArthur, California for the past thirteen months, is now en route for France. The hearty good wishes of the West go with Captain Baker in his patriotic endeavors and we know that the same splendid spirit of patriotic fervor that now pervades the West will go with him in his every act.

J. P. Bell, Pacific Coast manager of the Standard Under-ground Cable Company with headquarters in San Francisco, is at Seattle, Washington.

E. H. Jacobs, until recently chief engineer of the Electrical Engineers Equipment Company, Chicago, has been appointed general manager, succeeding Frank H. Getts, who died recently. Mr. Jacobs was connected with the General Electric Company for 18 years, spending considerable time in the testing, switchboard and drafting departments. During the last two years of his connection with the General Electric Company, Mr. Jacobs made investigations and recommendations for operations and extensions in power systems, covering the entire United States and Canada. He was made chief engineer of the Electrical Engineers Equipment Company in October, 1916.

Gilbert Woodill, representing the Hulse Electric Company of Los Angeles, is a recent San Francisco visitor.

Frank A. Bauman of Portland, Oregon, has been in Los Angeles, for some time and expects to remain for a week or two longer.

E. R. Davis and **G. B. McLean** of the Southern California Edison Company, Los Angeles, have been recent San Francisco visitors.

W. A. Cooper has taken over the management of the Mountain States Telephone Company at Flagstaff, Arizona, succeeding L. C. Riley.

R. S. Bonsib has recently been appointed district safety engineer for the U. S. Emergency Fleet Corporation for District No. 7, with headquarters in San Francisco.

G. S. Hoyt, formerly in charge of stocks and orders department of the Baker-Joslyn Company, has enlisted in the United States army and is now at Camp Fremont.

C. C. Gifford, electrical engineer for the Los Angeles Shipbuilding & Dry Dock Company, recently spent a few days' inspecting the various shipbuilding plants around San Francisco bay.

James O. Hoover, formerly with the Federal Trade Commission, has joined the force under Schwabacher, California Fuel Administrator. Mr. Hoover is to be special agent of the Bureau of Investigations.

F. J. Marshall has been appointed manager of the Alameda, California, exchange of the Pacific Telephone & Telegraph Company, succeeding H. T. Brownlee, who has resigned to take up another line of business.

Norton C. Lloyd, electrical engineer in charge of safety work in the Bureau of Standards, Washington, D. C., has been appointed a member of the Electric Committee of the National Fire Protection Association, to represent the Bureau.

O. I. Crites, lately connected with the division office of the Pacific Telephone & Telegraph Company at San Francisco, has been appointed manager of the Modesto office of that company to succeed Edward Garner, who retires from service and goes East.

Professor O. F. Stafford, head of the department of chemistry in the University of Oregon, left recently for Boston to make a demonstration of his new wood-distillation process for a large New England corporation. Mr. Stafford expects to be gone several weeks.

H. T. Cory, who has for the past several years conducted civil engineering offices in San Francisco, has closed his offices for the period of the war and has gone to Washington, D. C., where he has in the past months been actively assisting in National Red Cross work.

J. W. Dorrington, formerly with Graham-Reynolds Company at Los Angeles, is now a salesman with Baker-Joslyn Company at San Francisco. **R. E. Bond,** formerly with the S. L. G. Knox Engineering Company and later with the Federal Reserve Bank, is now in charge of warehouse for the Baker-Joslyn Company.

G. R. Geary, in charge of the General Electric Company's offices in Japan, is expected to sail for the island empire the latter part of September. Mr. Geary is an interesting and forceful speaker. He will address both the San Francisco Electrical Development League and the San Francisco Engineers' Club before leaving.

E. B. Walthal, assistant general manager of the San Joaquin Light & Power Corporation and chairman of the commercial committee of the Pacific Coast Section, N. E. L. A., is a recent San Francisco visitor. Mr. Walthall is lining up some very helpful war service activities for his committee that should prove helpful and timely to the industry at large.

John C. Koons, First Assistant Postmaster General; **David J. Lewis,** commissioner, United States Tariff Commission; and **William H. Lamar,** solicitor for the Post Office Department, have been appointed a committee for the governmental management, operation, and control of the telegraph and telephone systems. The Postmaster General serves as chairman of the committee.

Ross B. Mateer, formerly industrial engineer for the Southern Sierras Power Company with headquarters at Riverside, Cal., and later with the Philadelphia Electric Company, is now a captain in the Engineer's Reserve Officers' Corps and is stationed at Camp Lee, Petersburg, Va. Mr. Mateer became widely known throughout the West due to a very helpful series of articles he compiled on electric pumping and reservoiring in the agricultural districts of Southern California that appeared in the columns of the Journal of Electricity for many months.

Magnus W. Alexander, managing director of the National Industrial Conference Board and consulting Engineer of the General Electric Company, is the guest of the San Francisco Chamber of Commerce. Mr. Alexander took the lead in the organization of what is known as the Yama Conference, which has brought together from time to time the business leaders of the nation in a series of conferences, which have had an inspirational and educational effect, not only on the industrial life of the community but on the thoughts and actions of the participants.

Fred A. Rasch, examiner for the Oregon power service commission, has returned to Portland after completing a two months' survey of eastern, middle western and western cities as regards their public utilities. Mr. Rasch left Portland May 21 and visited Denver, Omaha, Minneapolis, St. Paul, Milwaukee, Chicago, Toledo, Cleveland, Buffalo, Rochester, Boston, New York, Philadelphia, Baltimore, Norfolk, Washington, Pittsburgh, Cincinnati, Indianapolis, St. Louis, Kansas City, Los Angeles and San Francisco. He looked into the situations in those cities as regards street railways, gas, water and terminal facilities and will have an inclusive report for the Portland Chamber of Commerce and the public service commission. He also conferred with the explosives bureau, products division of the War Department, regarding the toluol product of gas industries.

OBITUARY

Charles Allis, first president of the reorganized Allis-Chalmers Manufacturing Company, Milwaukee, Wis., died of pneumonia on July 22 at the age of 65 years. At the time of his death Mr. Allis was president of the Chicago Belting Company, a trustee and member of the executive committee of the Northwestern Mutual Life Insurance Company, and was also identified with many large manufacturing concerns. He had since the beginning of the war given most of his time to the Milwaukee County Council of Defense, and his death comes as a great shock to his many friends and business associates.

MEETING NOTICES FOR ELECTRICAL MEN

(The change in plans for the convention of the Northwest Light and Power Association and the consequent postponement of several of the conventions planned before and after is perhaps the most important announcement of the two weeks period. The California Cooperative Campaign dinner, announced in the last issue, has been indefinitely postponed and other changes should be noted.—The Editor.)

Northwest Light and Power Association Convention

It has been definitely decided by the executive committee to hold only a one day session instead of three this year, the reason being the shortage of men in the various member companies which would greatly embarrass them to send the proper representation to a three day session. This shortage also causes it to be nearly impossible to get a sufficient number of papers prepared.

Therefore a one day convention will be held with Class A members or their representatives attending. This meeting is to take place at Portland, Oregon, as scheduled on Friday, September 13th.

The morning session will be devoted to the reports of standing committees and the afternoon session to an open meeting of the executive committee, at which time the available papers will be read.

Supply Jobbers Association Convention Change

Owing to the fact that the proposed Convention of the Northwest Electric Light Association was cancelled and because of the present war conditions, the Chairman of the Pacific Division with the advice of the northern members thereof has changed the next meeting of the Pacific Division to Del Monte, August 22nd, 23rd and 24th. The usual reservations will be made and all members of the Division are expected to attend. The first session will be held Thursday afternoon, August 22nd, at 2:30 p.m.

The British Columbia Association of Electrical Contractors and Dealers

The Second Annual Meeting of the British Columbia Association of Electrical Contractors and Dealers has been postponed to Sept. 13th and 14th, at Victoria, B. C. The plans for the meeting are the same as those reported in the July 15th issue of the Journal of Electricity except for the change of date and all electrical men from the West who are interested are cordially invited to attend. The program includes a banquet and a picnic as well as regular meetings. For further information apply to 406 Yorkshire Building, Vancouver, B. C.

Oregon Association of Electrical Contractors and Dealers

Secretary-Treasurer J. W. Oberender, 302 Dekum Building, Portland, Ore., reports that the annual meeting of the association will be held Sept. 12, 13 and 14, 1918.

Pacific Coast Gas Association

Attention is called to the annual "Wrinkle Week" of the association which is to be held this year during the week commencing August 12th.

Soliciting contributions has been delayed until this period in order to allow sufficient time for all to encounter something new, novel or unique. Anything which will be of value to the members, whether accounting, new business, production, distribution or consumption is solicited. If it is of value to the originator then surely it is worth something to the balance.

California Electrical Cooperative Campaign

The Get-together Dinner scheduled to be held in Fresno in August has been indefinitely postponed. The advisory committee plans to meet at Fresno on Sept. 6th and 7th, however.

W. F. Brainerd, Northern California representative of the campaign, has been devoting his time recently to the San Jose district and reports very satisfactory conditions there.

BUILDERS OF THE WEST—XXXIV

HERBERT A. BARRE

A score of years ago saw a number of notable men in the making at the University of California — John M. Eshleman, Max Thelen, James D. Mortimer, A. E. Chandler, and Herbert A. Barre. Since that eventful period the great transmission lines of the West have established such records in daring as to win the admiration of the world in their wonderful accomplishments. To Herbert A. Barre, electrical engineer of the Southern California Edison Company, this issue of the Journal of Electricity is dedicated as a lasting memorial for his part in the construction of the highest voltage transmission system in the world.

San Francisco Section A. S. M. E.

The new executive committee of the San Francisco Section, A. S. M. E. has met at the offices of E. C. Jones, chairman of the Section, and a most constructive program has been outlined for the new season. Elgin Stoddard, of Chas. C. Moore & Company, will present a paper on fuel conservation at the first meeting of the year which will be held September 26th at the San Francisco Engineers' Club. A symposium will follow the paper which it is believed will bring out much helpful discussion on this great present day national problem.

Portland Joint Meeting

Alfred Douglas Flinn of New York, secretary of the National Engineering Council and one of the noted engineers of America, was the guest of the Portland engineers at a meeting held July 27th . He was the chief speaker at a banquet given jointly by the local engineering bodies in the Benson Hotel.

The Engineering Council is an organization of national technical societies of America, created to provide for consideration of matters of common concern to engineers, as well as those of public welfare in which the profession is interested, in order that united action may be made possible. Mr. Flinn is an engineer of national standing and is on tour from coast to coast meeting representative engineers in the larger cities to tell them about the centralized activities of the leading national engineering societies as carried on by the United Engineering Society, Engineering Council, Engineering Foundation and Engineering Societies' Library.

Engineers' Club of San Francisco

A blank form is being sent out by the Engineers' Club of San Francisco requesting addresses and telephone numbers

of members, together with information as to present occupation or professional specialties. This matter later is to be used in the compilation of the 1918 catalogue.

Foreign Trade Club

At the July 31st meeting of the Foreign Trade Club, W. A. Burns, manager at Shanghai, China, of the American Trading Company, spoke on the subject: "America's Opportunity in China." Mr. Burns has recently arrived from China and has a most comprehensive knowledge of present conditions in that country. A second feature of the evening was an address by Mr. J. R. Dunlop, a recent arrival from India, on the subject: "India and Malaya."

On Wednesday evening, Aug. 7th, Senor R. H. de Farrari, president of Edwards & Company, the oldest banking house in Valparaiso, Chili, addressed the meeting on the subject: "Chile and Its Markets." Mr. F. J. Frank, a merchant of Java, spoke on "Java and the East Indies."

WHERE THE MEN OF THE INDUSTRY MEET

(The place where you can find where and when the other man meets. Information as to changes in officers, or additions or corrections, should be addressed to the Service Editor, Journal of Electricity. It is hoped to keep this directory up to date, so that travelers in a strange town who wish to attend the meetings of allied groups may not be misdirected.—The Editor.)

A. I. E. E.—WESTERN SECTIONS

National Officers
President—Comfort A. Adams, Harvard University.
Secretary—F. L. Hutchinson, Engineering Society Bldg., New York City.
Meetings—Monthly.

Los Angeles Section
Chairman—Don. D. Morgan, 621 Pacific Electric Bldg.
Secretary—A. W. Nye, University of Southern California, Los Angeles, Cal.
Meetings—Second Tuesday of each month.

Portland Section
Chairman—R. M. Boykin, care North Coast Power Co., 441 Pittock Block, Portland, Ore.
Secretary—W. D. Scott, Portland, Ore.
Meetings—Monthly.

Denver Section
Chairman—Norman Read, 828 Symes Bldg., Denver, Colo.
Secretary—Robt. B. Bonney, 603 Wyoming Bldg., Denver, Colo.
Meetings—Third Saturday of each month, from October to May, at the Denver Athletic Club. Dinner at 6:15 p.m., followed by regular meeting.

San Francisco Section
Chairman—J. C. Clark, Stanford University, Cal.
Secretary—Allen G. Jones, Rialto Bldg., San Francisco.
Meetings—Fourth Friday each month—Engineers' Club, 7 p.m.

Seattle Section
Chairman—John Harisberger, 4015—4th Ave. N. E., Seattle, Wash.
Secretary—Glen Dunbar, City Lighting Department, Seattle, Wash.
Meetings—Monthly on third Tuesday in Chamber of Commerce Assembly Room, 9th floor, Arctic Bldg.

Spokane Section
Chairman—Charles A. Lund, W. 828 Providence, Spokane, Wash.
Secretary—J. E. E. Royer, W. 408 Cleveland, Spokane, Wash.
Meetings—Third Friday of each month.

Utah Section
Chairman—A. S. Peters, Mountain States Telephone & Telegraph Co., Salt Lake City, Utah.
Secretary—H. T. Plumb, 183 U St., Salt Lake City, Utah.
Meetings—Third Wednesday of alternate months, 8 o'clock. Assembly Room of Commercial Club, Salt Lake City.

Vancouver Section
Chairman—R. F. Hayward, Western Canada Power Co., Ltd., Vancouver, B. C.
Secretary—T. H. Crosby, Canadian Westinghouse Co., Vancouver, B. C.

A. I. E. E.—WESTERN BRANCHES

University of California Branch
Chairman—A. J. Swank, University of California, Berkeley, Cal.
Secretary—G. F. Teale, University of California, Berkeley, Cal.

University of Colorado Branch
President—Robt. Newman, 1071—11th St., Boulder, Colo.
Secretary—William N. Gittings, 2429—12th St., Boulder, Colo.
Meetings—First and third Thursdays of each month of the school year in the Engineering Building, University Campus.

Idaho University Branch
Chairman—V. Pearson, Moscow, Idaho.
Secretary—L. J. Corbett, University of Idaho, Moscow, Idaho.
Meetings—First Wednesday evening of each month from October to June.

Oregon Agricultural College Branch
Chairman—J. A. Hooper, Oregon Agr. College, Corvallis, Ore.
Secretary—L. Happold, Oregon Agr. College, Corvallis, Ore.

Stanford University Branch
Chairman—H. W. Lewis, Stanford University, Cal.
Secretary—A. L. Morgan, Stanford University, Cal.

Montana State College Branch
Chairman—Roy C. Flagen, Montana State College, Bozeman, Mont.
Secretary—J. A. Thaler, Montana State College, Bozeman, Mont.
Meetings—Third Friday of every month of the school year in the Electrical Bldg.

Colorado State Agricultural College
Chairman—R. C. Richards.
Secretary—W. A. Stallings, Colorado State Agricultural College, Fort Collins, Colo.

Throop College of Technology Branch
Chairman—J. Paul Youts, Throop Dormitory, Pasadena, Cal.
Secretary—Clark E. Baker, Throop Dormitory, Pasadena, Cal.

State College of Washington Branch
Chairman—S. E. States, 301 Montgomery St., Pullman, Wash.
Secretary—E. W. Tollefson, Box 393 College Sta., Pullman, Wash.
Meetings—Bimonthly at Mechanics Art Bldg., Pullman, Wash.

CONTRACTOR-DEALER ASSOCIATIONS

National Association of Electrical Contractors and Dealers
Chairman—W. Creighton Peet.
Secretary—Harry C. Brown, 110 West 4th St., New York.
Executive Committeemen-at-Large—W. D. Kohlwey, California; Executive Committeeman—S. C. Jaggar, Portland.

British Columbia Ass'n Electrical Contractors and Dealers
President—C. H. E. Williams, 509 Richards St., Vancouver, B. C.
Secretary—Capt. W. J. Conway, Vancouver, B. C.
Meetings—First Tuesday of each month.
Annual Meeting, Sept. 13-14, Victoria, B. C.

California Ass'n of Electrical Contractors and Dealers
President—H. C. Reid, 507 Montgomery St., San Francisco.
Secretary—J. W. Redpath, Rialto Bldg., San Francisco.
Meetings—Monthly.

Electrical Contractors and Dealers Ass'n of San Francisco
President—J. M. Carlson, 175 Jessie St., San Francisco.
Secretary—J. W. Asher, 601 Howard St., San Francisco.
Meetings—Monday, 12:15; Jules Sutter Cafe.

Southern California Electrical Contractors and Dealers
President—G. E. Arbogast, 724 So. Olive St., Los Angeles, Cal.
Secretary—J. E. Wilson, 425 Consolidated Realty Bldg., Los Angeles, Cal.
Meetings—Every Friday at 6:30 p.m. at the Pin Ton Cafe, 427 South Broadway.

Monterey Bay Electrical Contractors and Dealers
President—W. Cox, Santa Cruz.
Secretary—J. A. Noggle, Monterey.

Nevada Ass'n of Electrical Contractors and Dealers
President—F. V. McAvoy, 138 N. Canter St., Reno.
Secretary—R. W. Shearer, 215 Sierra St., Reno.
Meetings—Twice a month, 15th and 30th.

Oregon Ass'n of Electrical Contractors and Dealers
President—A. S. Halls, 262 Stark St., Portland.
Secretary—J. Willis Oberender, 301-2 Dekum Bldg., Portland, Ore.

Portland Local Ass'n of Electrical Contractors and Dealers
President—J. H. Sroufe, Jaggar-Sroufe Co., Portland.

Utah Society of Electrical Contractors and Dealers
President—J. V. Buckle, Buckle Electrical Co., 70 E. 1st St., Salt Lake City.
Secretary—E. H. Eardley, Eardley Bros. Co., 37 E. 1st St., Salt Lake City.
Meetings—Every Friday noon at Commercial Club.

Washington Ass'n of Electrical Contractors and Dealers
President—V. S. McKenny, NePage & McKenny Co., Armour Bldg., Seattle, Wash.
Secretary—W. D. Alleson, 404 Oriental Bldg., Seattle, Wash.
Meetings—Quarterly—second Thursdays of March, June, September and December.

JOBBERS' ASSOCIATIONS

Electrical Supply Jobbers Association
General Secretary—Franklin Overbagh, 411 So. Clinton St., Chicago, Ill.
Meetings—Semi-annual.

Pacific Coast Electrical Supply Jobbers
President—W. S. Berry, Western Electric Company, San Francisco.
Secretary—Albert H. Elliot, 544 Market St., San Francisco.
Meetings—Quarterly.
Next meeting, Del Monte, Aug. 22-24, 1918.

Electrical Credit Ass'n of the Pacific Coast
President—C. L. Gilson, Gilson Electrical Supply Co., 304—12th St., Oakland, Cal.
Secretary—Albert H. Elliot, 544 Market St., San Francisco.
Meetings—annually; San Francisco; May.

OF ELECTRICAL INTEREST

National Electric Light Association
President—W. F. Wells, Edison Elec. Illuminating Co., Brooklyn.
Executive Secretary—T. C. Martin, 33 W. 39th St., New York City.

Nevada Section, N. E. L. A.
Chairman—Geo. A. Campbell, Reno, Nev.

Pacific Coast Section, N. E. L. A.
President—Samuel Kahn, Western States Gas & Electric Co., Stockton, Cal.
Secretary—A. H. Halloran, Journal of Electricity, Crossley Bldg., San Francisco.
Meetings—Annually, in April.

Portland Section, N. E. L. A.
Chairman—H. H. Schoolfield, Pacific Power & Light Co., Portland.
Secretary—F. H. Murphy.

Illuminating Engineering Society
President—George A. Hoadley.
Secretary—Clarence L. Law.
Western representative—Romaine Myers, Bacon Bldg., Oakland.
Meetings—First Tuesday each month.

New Mexico Electrical Association
President—M. R. Buchanan, Silver City, N. M.
Secretary—E. M. Haggerson, Silver City, N. M.
Meetings—Annually, in February.

Southwestern Electric and Gas Association
President—H. C. Morris.
Secretary—H. S. Cooper, 403 Slaughter Bldg., Dallas, Texas.

Northwest Electric Light and Power Ass'n
President—Guy W. Talbot, 1212 Spalding Bldg., Portland, Ore.
Secretary—Geo. L. Myers, 1212 Spalding Bldg., Portland, Ore.
Meetings—Convention held annually. Executive Committee, governing body of Association, meets upon call of its chairman.
Next convention will convene in Portland, September 13, 1918.

Los Angeles Jovian Electrical League
President—H. N. Sessions, San Fernando Bldg., Los Angeles.
Secretary—W. C. McWhinney, Southern California Edison Co.
Meetings—Every Wednesday, 12 m.

San Francisco Electrical Development League
President—R. E. Fisher, Pac. Gas & Elec. Co...
Secretary—J. W. Redpath, Rialto Bldg., San Francisco.
Meetings—Every Wednesday, 12:10 p.m.; luncheon, Palace Hotel.

Electric Metermen's Association
President—J. E. Bridges, Westinghouse Electric & Manufacturing Company.
Secretary—A. E. Coney, Great Western Power Company, San Francisco.
Meetings—About every 60 days.

Alameda County Electrical Club
President—George Drew, Pacific States Electric Company, Oakland, Cal.
Secretary—George B. Furniss, Pacific Gas & Electric Company, Oakland, Cal.

Synchronous Club
Secretary—C. A. Blair, Los Angeles.
August 1st—Election of Officers.

Telephone and Telegraph Society of the Pacific Coast—San Francisco Section
President—L. S. Hamm, Pacific Tel. & Tel. Co., San Francisco.
Secretary—Chas. H. Dodson, 835 Howard St., San Francisco.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

National Officers
President—Charles T. Main, Engineering Society Bldg., New York City.
Secretary—Calvin W. Rice, Engineering Society Bldg., New York City.

San Francisco Section, A. S. M. E.
President—E. C. Jones, Pacific Gas & Electric Co., San Francisco.
Secretary—Geo. L. Hurst, Bethlehem Ship Bldg. Corp., Ltd., San Francisco.
Meetings—Quarterly.
Thursday lunches have been arranged at the Engineers' Club, 57 Post St.
Annual Meeting — September 26th, Engineers' Club.

Los Angeles Section, A. S. M. E.
President—F. G. Pease, Mt. Wilson Solar Observatory, Pasadena, Cal.
Meetings—Quarterly.

ENGINEERS' CLUBS

Oregon Society of Engineers
President—Orrin E. Stanley, Box 973, Portland, Ore.
Secretary—C. J. Hogue, Box 973, Portland, Ore.
Meetings — Annual: Feb. 4, 1918. Monthly: Third Thursday of each month.

The Engineers' Club of Seattle
President—J. F. Pinson, Seattle, Wash.
Secretary—E. J. Bartells, Northern Life Bldg., Seattle, Wash.
Meetings—Thursday noon at the club rooms at 410 Arctic Bldg. A buffet luncheon is served every day. A special welcome is extended to all engineers visiting the city.

Engineers' Club of San Francisco
President—B. P. Legare, 58 Sutter St., San Francisco.
Secretary—J. R. Brownell, 525 Market St., San Francisco.
Annual Meeting: October.

Idaho Society of Engineers
President — W. H. Gibson, Mountain Home, Idaho.
Secretary—Ira F. Shaffner, Boise, Idaho.

Engineers' Club of Oakland
President—R. S. Chew, Oakland Chamber of Commerce, Oakland.

Engineers' Club of Sacramento
President — George S. Nickerson, 914 Forum Bldg., Sacramento.
Secretary—P. M. Noeboe, State Department of Engineering, Forum Bldg., Sacramento.

MISCELLANEOUS

American Ass'n for the Advancement of Science—Pacific Division
President—D. T. MacDougal, Director Desert Laboratory, Carnegie Institution, Tucson, Arizona.
Secretary (acting)—J. R. Douglas, 430 Library, University of California, Berkeley, Cal.
Meetings—Annual.

American Chemical Society—Oregon Section
Secretary—Norman C. Thorne.

Foreign Trade Club
President—W. H. Hammer, Monadnock Bldg.
Secretary—Wm. E. Hague, Monadnock Bldg.
Meetings—238 Merchants Exchange Bldg., San Francisco. Every Wednesday evening.
Aug. 7th—"Chile and Its Markets" and "Java and the East Indies."

Pacific Coast Gas Association
President—John D. Kuster, care Pacific Gas & Electric Co., San Jose, Cal.
Secretary—Henry Bostwick, 445 Sutter St., San Francisco.
Meetings—Annual Next convention—September, 1918, in Los Angeles.

Society for Promotion of Engineering Education
Secretary—F. L. Bishop, University of Pittsburgh, Pittsburgh, Pa.

HAPPENINGS IN THE INDUSTRY

U. S. EMPLOYMENT SERVICE TAKES OVER RECRUITING OF LABOR

On August 1, the supplying of war industries with common labor was centralized in the U. S. Employment Service of the Department of Labor, and all independent recruiting of common labor by manufacturers having a payroll of more than 100 men diverted to the U. S. Employment Service. This is in accordance with the decision of the War Labor Policies Board and approved by the President on June 17. The above action was found necessary to overcome a perilous shortage of unskilled labor in war industries. This shortage was aggravated by an almost universal practice of labor stealing and poaching.

Applies Only to Common Labor—

While the restrictions against the private employment of labor apply only to common labor at the present time, these restrictions will, as soon as possible, be extended to include skilled labor. In the meantime, recruiting of skilled labor for war production will be subject to federal regulations now being prepared.

This drastic change in the nation's labor program has been found necessary in order to protect the employer and the employed, to conserve the labor supply of the communities and to cut down unnecessary and expensive labor turnover (which, in some cases, is as high as 100% a week), and to increase the production of essentials.

While non-essential industries will be drawn upon to supply the necessary labor for war work, the withdrawal will be conducted on an equitable basis in order to protect the individual employer as much as possible.

The System—

Under the operating methods adopted, the country has been divided into thirteen federal districts, each district in charge of a superintendent of the U. S. Employment Service. The States within each district are in turn in charge of a State Director, who has full control of the service within his State.

In each community there is being formed a local community labor board, consisting of a representative of the U. S. Employment Service, a representative of employers and a representative of the employed. This board will have jurisdiction over recruiting and distributing labor in its locality.

A survey of the labor requirements is being made, and in order that each community may be fully protected, rulings have been issued that no labor shall be transported out of any community by the U. S. Employment Service without the approval of the State Director; nor shall any labor be removed by the Service from one state to another without the approval of the U. S. Employment Service at Washington. Every effort will be made to discourage any movements from community to community or state to state by any other service.

Classes Affected—

The requirement that unskilled labor must be recruited through the sole agency of the U. S. Employment Service does not at present apply in the following five cases:

1. Labor which is not directly or indirectly solicited.
2. Labor for the railroads.
3. Farm labor—to be recruited in accordance with existing arrangement with Department of Agriculture.
4. Labor for non-war work.
5. Labor for establishments whose maximum force does not exceed one hundred.

When the survey of labor requirements has been made and the aggregate demand for unskilled labor in war work is found, each State will be assigned a quota, representing the common labor to be drawn from among men engaged in non-essential industries in that State.

APPLICATIONS FOR COMMISSIONS IN ENGINEER RESERVE CORPS

Applications for examination for a commission in the Engineer Reserve Corps will be received from qualified engineers, if forwarded to the office of the Chief of Engineers, Washington, D. C., together with the experience data required and naming the city in which it is desired to be examined.

When these applications have been received at the office of Chief of Engineers, the qualifications of the applicants will be considered and those selected will be notified when to appear at the designated place for the professional and physical examination, which will be conducted by a board of officers sent out from Washington, D. C. The papers of those who qualify will be sent to the Chief of Engineers, at Washington, who will take the necessary steps to have them commissioned as officers in the Engineer Reserve Corps.

The Examining Board will only receive applications for appointment in the grades of first lieutenant and captain, and only those applicants meeting the following requirements will be considered, viz:

Age limits: For the grade of first lieutenant—32 to 36 years; for captain—36 to 42. These limits may be slightly increased or decreased in special cases, except that no one who is within the draft age will be considered.

Applicants must be engaged in the active practice of the engineering profession, in one of its branches, and be in good physical condition.

Professional qualifications and experience: No set rules have been established. An applicant's fitness for commission will be determined by the Examining Board.

All applicants must be citizens of the United States. No applications will be received from any one born in a country with which the United States is at war, or born in a country allied with a country with which the United States is at war, even though he be a naturalized citizen of this country.

All applicants accepted by the Examining Board will be commissioned within ten days or two weeks, and within a few days thereafter will receive orders to report to an Engineer Officers' Training Camp, either at Camp Lee, Petersburg, Virginia, or at Camp Humphreys, Virginia, near Washington, where they will be given a course in military training previous to being assigned to duty with Engineer troops.

Applicants must understand, however, that it is required of an Engineer officer that he not only be professionally qualified, but must also possess the requisite qualities of leadership and temperament to fit him for the command of troops. The case of each student officer will be carefully considered by a Board of Officers of the Corps of Engineers of the Regular Army, just previous to the completion of his course of instruction (unless circumstances necessitate an earlier consideration) and, as a result of the showing which he has made, he will either be allowed to retain his commission, or will be honorably discharged.

The Government will allow traveling expenses at the rate of seven cents per mile to applicants who may be commissioned, and they will also receive, while in the training camp, the regular pay of an officer of their rank.

Applicants who receive commissions and are ordered to camp, should provide themselves only with the usual Engineer officers' uniform, cap, puttees and tan shoes. For training purposes, the camp authorities will issue them, on memorandum receipt, equipment, and will provide the necessary sleeping accommodations.

The only manner in which men between 21 and 42 years of age may be certified to attend an Engineer Officers' Training Camp is to be ordered there for duty as students after having been commissioned in the Engineer Reserve Corps.

Blanks may be obtained by applying to the Chief of Engineers, War Department, Washington, D. C.

Signed, W. M. BLACK,
Major General, Chief of Engineers.

In accordance with the above bulletin, the Military Training Camp Association, whose address is Room 916 No. 14 Montgomery Street, San Francisco, California, is prepared to furnish the necessary blanks and information to all those desiring to apply. Major Edward H. Williams will be in San Francisco, as nearly as we can tell, some time during the month of September, to examine applicants. The exact date for the examinations will be announced later, although at present the dates are tentatively set for Septtember 2, 3, 4, 1918. Attention of applicants is particularly called to the fact that quick action on their part is necessary, for the applications must be sent to Washington in time to arrive there and be examined before Major Williams comes to San Francisco. The examinations in this city by Major Williams will be held at Army Headquarters, Santa Fe Building, Second and Market streets, San Francisco, California.

GOVERNMENT MANAGEMENT OF TELEGRAPH LINES

The telephone and telegraph service of the country was taken over by the U. S. Government on August 1st. No drastic changes are planned and except for the elimination of duplicate services, the management will be continued as before, it is announced.

THE RECORD OF THE WEST IN THE LIBERTY LOAN

In the detailed report of the Third Liberty Loan in the Twelfth Federal Reserve District just compiled from the official records it is found that Pinal County, Arizona, holds the record for the highest oversubscription with 1308.96 per cent of its quota. White Pine County, Nevada, was first in the percentage of population, subscribing with a record of 67.68 per cent.

Gila County, Arizona, won second place nationally in per capita subscriptions obtained by women and White Pine County, Nevada, was fourth nationally.

In this district Alaska won over the states in the percentage subscribed according to quota, with a record of 252.58 per cent. Arizona was second with 213.17 per cent and Nevada third with 186.05 per cent. In the percentage of population subscribing, Southern California was first with 34.73 per cent and Northern California second with 28.76 per cent.

The percentage of subscription according to quota in the entire district was 136.13 per cent and the percentage in the district according to population was 25.71 per cent. The national percentage of quota was 139%. Oregon was the first state in the district to reach its quota and if it had not been for an error in making the report of one bank Oregon would have had the national honor, winning from Iowa which was first officially by a few hours.

Among the larger cities of the Twelfth District, Vancouver, Washington, was first in the percentage of amount of quota subscribed with a total of 731.55 per cent. Alameda, California, was second with a percentage of 369.89.

Phoenix, Arizona, led the large cities of the district in the percentage of population subscribing, having a total of 86.28 per cent. Long Beach, California, was second with a total of 76.21%.

The Fourth loan will be offered September 28 to October 19. The amount has not been determined but is expected to be six or eight billions.

WILSON URGED TO ESTABLISH PUBLIC UTILITIES BUREAU

Establishment of a national public utilities administration to recommend rate increases for certain utilities as a war

measure has been recommended to President Wilson by the National Association of Railways and Utility Commissioners representing practically all State commissions. This recommendation is similar to that made by the War Labor Board in connection with the awarding of wage increases to employes of a number of street railways. Special significance was attached to the association's proposal, inasmuch as it represents the views of many members of the local and State bodies with rate supervision powers.

The association's proposals, contained in a letter to the President, included the following:

"Establishment of a national administrator or board of three with power of recommendation, advice or requests to the State and municipal authorities.

"No disturbance of the rate and service powers of the State commissions or the contracting powers of the municipalities, except as the State or local authorities may subordinate these to the Federal recommendations for the war-time emergency, as we believe would almost uniformly be done."

MARE ISLAND HOUSING DEVELOPMENT

Contracts amounting to $1,500,000 have been awarded by the United States Housing Corporation for the Mare island housing development plan. J. A. Marshall of Berkeley will do the grading, street paving, water, sewer and gas piping, street and house lighting and will construct a pumping plant and storage reservoir.

Construction was expected to begin Monday, August 12. The time of completion of the utilities for the project has been limited to eighty days. All of the streets will be paved and lighted with the electrolier system of lighting from underground conduits. No overhead lighting will be permitted along the streets, all house lighting and telephone wires being carried on pole lines at the rear of the lots. The pumping plant will have a capacity of 500,000 gallons and will provide an auxiliary water supply and fire protection service.

CALIFORNIA FUEL ADMINISTRATION

New regulations governing the use of lights during August and September were announced recently by State Fuel Administrator Albert E. Schwabacker as follows:

No lights to be used for advertisements, signs or external illumination of any buildings when such are not open for business. During business hours, sufficient lights may be used for public safety, but no lights are to be permitted in show windows. Exceptions to this rule may be made, however, on Saturday, Sunday and legal holiday nights.

No street lights may be used except as necessary for public safety. No lights may be used until thirty minutes after sunset and none from sunrise to sunset. Deprivation of electric service will be the penalty for violations.

These regulations virtually confirm the rulings of the power companies and Railroad Commission representative reported in the Aug. 1st issue.

TRADE NOTES

A New Plant—

The plant of the United Steel Company at Everett, Washington, is well under way and it is expected that operations will begin some time in October. The site is 700 by 262 feet and served by three railroads. The machine ship and heating plant will be 300 feet long by 74 feet wide. The plant is to be electrically operated throughout, using eight electric motors, one of 800 horsepower. There will be one straight heating, one continuously heating and two electric furnaces. The capacity will be from 100 to 150 tons and will employ 150 men. Commercial bars of all shapes and sizes will be turned out. J. Johnson is general manager.

Sale of Electric Ranges—

The municipal lighting plant of the city of Tacoma, Washington, in the interest of conservation is carrying out a very energetic campaign for the sale of electric ranges. The drive has been remarkably successful and it is doubtful if any other central station has recorded an equal success.

A Cutler-Hammer Picnic—

The eleventh annual picnic of the Cutler-Hammer Company was held on July 27th and was attended by a large number of C-H employes and their families. The main office and works of the Cutler-Hammer Manufacturing Company at Milwaukee were closed for the day.

Change of Address—

Bittman & Battee, electrical manufacturers' agents at San Francisco, have moved into new ground floor quarters at 84 Second Street, San Francisco.

SUBSTITUTION OF KNOB AND TUBE WORK FOR CONDUITS

A Letter to the Editor

Editor Journal of Electricity:

We have received from Mr. Parker a letter which is of much interest to the electrical public, and it explains a situation which the West has very little knowledge of at this time. This letter is self-explanatory, and reads as follows:

"Owing to the condition of the steel industry, in that the United States requires every ounce of steel that it is possible for them to get, for war purposes, a development is going on, the purpose of which is the use of porcelain in knobs, tubes, cleats, etc., and instead of iron conduit or steel flexible conduit, in fact any article which has a free abundance of steel in its construction.

"We have been asked if we can be depended upon to take care of the abnormal demand which will undoubtedly arise from a development to be started, fathered by the Government, sanctioned by the Underwriters, by supplying the necessary knobs, tubes, cleats, etc. We have answered in the affirmative, and it is desired that you make a point of discussing this proposition with every distributor, contractor, or consumer in your district, in order that the matter may have publicity and the assurance that their wants will be taken care of promptly and that they therefore may not hesitate to support this development which the Government desires very much to take place. You of course understand that the supply of clay and other material entering into the manufacture of porcelain is practically inexhaustible, whereas that of ore, and the equipments necessary for the converting of ore into steel commodities is to the contrary. We have canvassed the situation among our own interests and have determined that this plan is very practical and that the needs of all consumers can be readily taken care of."

While this letter clearly outlines the plan under way, it goes without saying that the present restrictions made by different cities to prevent the use of knobs and tube work in the different localities, will have to be modified or suspended during the remaining war period. A large amount of conduit will still have to be used because of its need as a race-way for wires in concrete structures. Wood frame buildings, and all open wirings can of course be done in knob and tube work. From other letters I have on file from various Underwriters in the country of national repute, it is the consensus of opinion that knob and tube work is as safe, if not safer than conduit and the fact is not recognized that conduit itself is a conductor and must be treated as such in devising rules of safety.

We will appreciate your giving this matter much publicity and assisting us in obtaining the opinions of the electrical public.

Thanking you, we beg to remain,

Very truly yours,

J. H. PARKER, INC.,

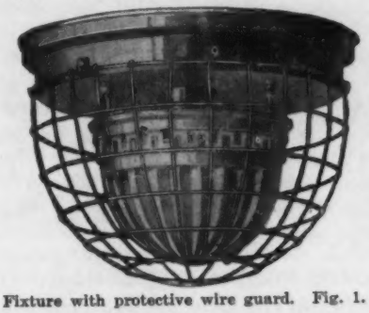
By H. S. PERKINS, Mgr.

LATEST IN EVERYTHING ELECTRICAL

(A protective guard for lighting units in gymnasiums and other locations subject to excessive jars of one sort and another—A piston vacuum machine for the sealing of cans and tumblers which reduces breakage to a minimum—A combined fuse and disconnecting switch for outdoor service and a new light weight safety car with high speed and quick starting characteristics.—The Editor.)

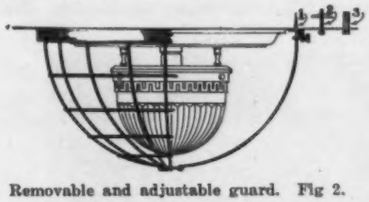
PROTECTIVE GUARD FOR LIGHTING UNITS

Although the Luminous Unit Company of St. Louis Mo., has long been prepared to furnish the Type BD Brascolite (Fig. 1) which is equipped with a wire guard to protect the lamp and diffusing bowl against mechanical injury, it has developed recently a guard of a new design. In the Type BD unit, the guard is integral with the remainder of the fixture. But the new guard, which is designated "Type BDX,' may be installed in combination with any of a number of Brascolites of different designs. Or it can be used to protect any other lighting unit which can be contained within it.



Fixture with protective wire guard. Fig. 1.

Guards have been found necessary in certain installations for enclosing lighting units because of the liability to breakage of the incandescent lamps and glassware. For example, experience has shown that the glassware and lamps installed in gymnasiums, squash-courts, over swimming pools and in certain shipping rooms and warehouses are subject to excessive breakage unless adequate mechanical protection is provided. In gymnasiums the breakage occurs during hand-ball games. When the fixtures are installed over swimming pools the water-polo balls are liable to rupture the glassware.



Removable and adjustable guard. Fig 2.

As shown in Fig. 2, the Type-BDX guard is supported by an angle-iron ring which is drilled with four holes to provide for fastening to the ceiling. The ring is entirely independent, mechanically, of the lighting unit which is to be protected. Therefore, when strains are imposed on the guard they are not transmitted to the lighting unit. The hemispherical wire cage is held to the ring with four knurled-head set-screws. These permit the easy removal or replacement of the guard to provide for cleaning and lamp renewal. The guard proper is made of mild steel wire, electrically welded at the junctions. Screws of any of three different types can be used for supporting the guard ring to the ceiling. As shown at "1" (Fig. 2) wood screws are supplied when it is specified that the ring is to be mounted on a wood or a plastered wood-lath ceiling. When it is specified that the ceiling is of metal-lath or hollow tile, toggle bolts as indicated at "2" are supplied. Expansion bolts will be shipped when it is specified that the ring is to be installed on a concrete, stone or glazed brick ceiling. The guards are made regularly in four different sizes.

DISC STOVES

The popularity of disc stoves will increase with the use of the Thermax 4 heat stove manufactured by Landers, Frary & Clark, of New Britain, Conn.

A disc 3 inches in diameter is surrounded by a ring 6 inches in diameter. Each has a heating unit which can be operated independently or in conjunction with the other.

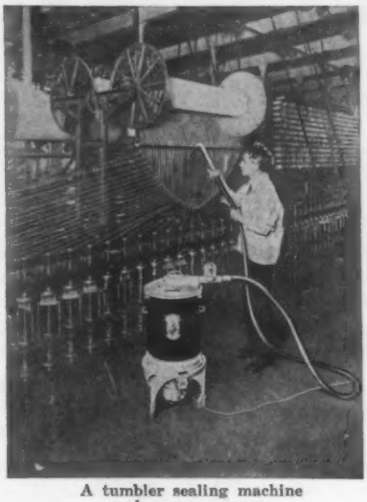
Two single stoves are thus connected in one and at a cost less than that of the regular two-heat 6-inch disc stove.

The nichrome wire heating unit is encased in a polished and blued cast iron top. The stand is nickel plated. Wattage of each unit, 300; total wattage, 600. A neat, convenient handle is provided.

This device has a wide field in homes, laboratories, schools, shops, drug stores, prescription counters, hospitals. It is guaranteed for one year against mechanical and electrical defects.

PISTON VACUUM MACHINE

This piston vacuum machine, used by canners and preservers, combines a tumbler sealing machine and a vacuum pump in one simple unit requiring only a ¾ hp. Westinghouse motor to operate it.



A tumbler sealing machine and vacuum pump

It is claimed that an ordinary operator can seal as many as 50 tumblers a minute with this machine with less effort than formerly because of the construction which enables him to perform the work of unloading and loading one pocket while the machine removes the air from the other pocket, and seals it. The degree of vacuum desired in each package can be regulated instantly. Broken tumblers are reduced to a minimum, since the sealing strain is applied through compensating springs which seal each jar alike, although one may be larger than the other. The variation is taken up in the spring. Changes from one size to another can be made easily in two or three minutes.

This machine is made in two types, for sealing tumblers from 2½ to 6 inches in height, by the Anchor Cap and Closure Corporation, Brooklyn, N. Y. The two-pocket type is used for dry or pastry products, and the four-pocket type for liquid or semi-liquid products which are apt to spill or splash. Either type is arranged to give three speeds as desired.

NEW ELECTRIC SMELTING FURNACE

The Bureau of Mines has recently announced the perfection of a type of electric melting furnace that may be revolutionary in the making of brass. Patents on this furnace, known as the Rocking electric furnace, have been taken out by the bureau and have been assigned to Secretary of

the Interior Lane as trustee. Free licenses to operate these furnaces under the patents, it is understood, can be obtained by making application through Van. H. Manning, Director of the Bureau of Mines.

The new furnace which it is claimed will reduce the important losses in brass melting, is the result of five years' experimentation by H. W. Gillett, chemist of the Bureau of Mines, in cooperation with the laboratory of Cornell University, the American Institute of Metals and a number of manufacturers of brass.

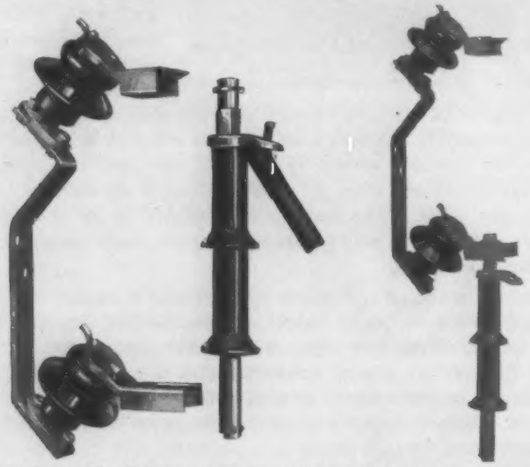
Up to the present most brass has been made in costly crucibles of imported clay and graphite. Since the war it has been impossible to obtain the imported materials for crucibles, and manufacturers have had to put up with crucibles of much poorer quality, and at a cost many times that of pre-war prices. With the huge tonnage of brass needed for war purposes, such as shells for cartridges, manufacturers have been anxious for a solution of the crucible problem. The bureau states it is inevitable that the next few years will see electric furnaces largely replacing crucible furnaces and that there will be a development comparable to that seen in the steel industry in the last few years. The electric furnace, it is also declared, will greatly decrease the loss of zinc which, together with copper, makes brass. Zinc boils at a much lower temperature than copper, and there have consequently been large losses in the open crucible furnace through volatilization of zinc. The electric furnace is closed and these losses are avoided. It is estimated that the unnecessary losses in brass-making are more than $3,000,000 a year in normal times and perhaps $10,000,000 a year in war times. Another claim for the electric furnace is that it gives more healthful working conditions for the men.

COMBINED FUSE AND DISCONNECTING SWITCH FOR OUTDOOR SERVICE

In connection with the operation of small outdoor substations the combined fuse and disconnecting switch here shown is used primarily for the protection of transformer banks where no primary switches are required.

The fuse is suitable for opening the exciting current of transformer banks not exceeding 300 kva. Secondary switches should be provided so that the load can be removed in case it should become necessary to open the primary side with fuses.

The fuse holder is removed by a fuse hook from the ground. To open the circuit the holder is lifted completely



15,000 volt combined fuse and disconnecting switch showing fuse holder being removed by fuse hook.—One the right fuse holder is suspended from lower contact clips.

out of the contacts by the fuse hook which is so constructed that the fuse holder will hang vertically when held by the hook. Then if desired, the upper end of the fuse holder is inserted in and hangs from the cap partly surrounding the lower contact clips.

To close the circuit, the upper contact of the holder is placed in the upper clips by the operating hook and then the lower contact is pressed by the hook into the lower clips.

The supporting insulators are of the petticoat type.

The fuse holder has petticoats so spaced as to provide ample creepage surface. The contact parts at the ends of the fuse holder are of brass and when the holder is in normal operating or closed position engage with the stationary contacts on the supporting insulators.

The fuse passes through the center of a treated fibre tube within the porcelain fuse holder and is attached to the upper or closed end of the fuse holder by a circular ring, which when tightened, holds the fuse firmly in place without a tendency to shear off, when the fuse blows. The explosion consequent upon the expansion of the gases formed, effectively expels the arc through the open end of the holder downward and instantaneously opens the circuit. New fuses may be inserted readily.

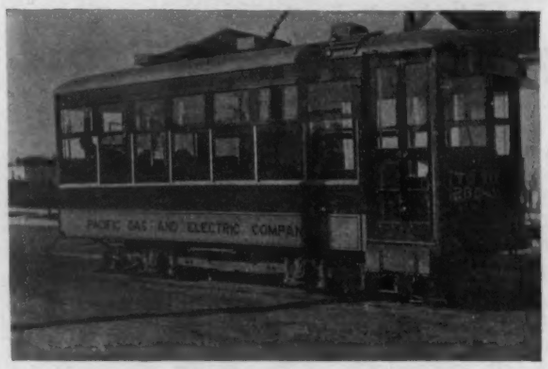
This combined fuse and disconnecting switch, made by the General Electric Company, Schnectady, and known as the type TD-127, is made in single-pole units for vertical mounting on flat surfaces. It can be obtained for use at 15,000, 22,000, 35,000 and 45,000 volts.

The maximum current rating is 50 amperes.

No special arrangements are needed for mounting. The supporting bracket is bolted to the cross arm.

NEW SAFETY CARS FOR SACRAMENTO

The Pacific Gas & Electric Company recently placed in regular service on its street railway lines in Sacramento four new Light Weight Safety Cars. These cars are of single track type and although seating comfortably thirty passengers weigh ready for operation eleven thousand pounds each, as compared with present car equipment which averages twenty-six thousand five hundred (26,500) pounds. Cars of this type are styled Efficiency Cars on many properties, due



New cars in service

to the fact that they consume about one-half the power required by old style rolling equipment. These cars were furnished by the American Car Company and have 22 ft.-10 in. steel bodies, with bridge girder sides and side parts and rafters continuous in one piece. Interior woodwork is mahogany and seats are latest folding cushion design. Car is mounted on Brill single truck equipped with 24 in. diameter wheels, necessitating only one step to floor of car. Cars are furnished for double end operation with air-electric Safety Car Devices Company equipment for the control of motors, brakes, doors, steps and sanders by the motor-conductor, but one man being required to operate the car and collect the fares. Electrical equipment includes two Westinghouse type 506, 25 h.p. interpole railway motors weighing nine hundred pounds each. The cars easily make a schedule speed of ten and one-half miles per hour and are capable of making twenty-five miles per hour. The high speed and quick "get away" characteristics of these light high powered cars resulting in reduced headway and more and better service make them very popular with the travelling public.

BOOKS AND BULLETINS

Miniature Direct Current Instruments

The General Electric Company has issued Bulletin No. 44017 on Miniature Direct Current Instruments, Type DM and DK-7. These miniature direct-current instruments are of the well known D'Arsonval, permanent magnet, moving coil construction. Notwithstanding their small size, they are remarkably accurate and are designed especially for small panels, battery-charging sets, automobile starting and lighting sets, electric vehicles and general equipment for small direct current installations.

A P. & S. Porcelain Cleat Receptacle is described in bulletin 45-A recently sent to the trade—and changes in list prices and standard package quantities are given in 11-A-1. An attachment plug and a description of P. & S. extension sockets form the subject matter of leaflet 5-A.

P. & S. 56-A describes a concealed-terminal, fuseless cleat rosette with pivot cap.

The Cutler-Hammer Manufacturing Company of Milwaukee, Wis., has just issued a four-page two-color envelope folder (publication 232) which shows several applications of C-H Push Button Porcelain Sockets. White porcelain sockets are especially adapted for use in the bath room where the socket and fixture should be in keeping with the white porcelain and enamelware. The folder points out the distinctive features of C-H Porcelain Sockets, such as the ease of installation, 660 watts capacity, and shock proof shell. The pendent type is suited for factories, store houses and basements and due to the push button mechanism requires only one hand to operate.

Storage of Bituminous Coal

The more general storage of coal during the spring and summer months is coming to be recognized as the only practical means of avoiding a coal shortage during the winter. Many corporations and individuals will this year undertake, for the first time, to store large quantities of coal.

The storage of bituminous coal presents certain difficulties because of its tendency toward spontaneous combustion with its attendant dangers and losses. The methods to be employed in avoiding spontaneous combustion have not generally been well understood and those which have seemed successful in some cases have failed in others.

The Engineering Experiment Station of the University of Illinois has just completed a study of the problems involved in coal storage and has published the results in a 200-page illustrated book designated as Circular No. 6 "Storage of Bituminous Coal." The study was made under the direction of H. H. Stoek, Professor of Mining Engineering. The reasons and advantages of storing coal are given, the kinds and sizes of coal which may be safely stored are described, and the many factors entering into successful storage are discussed.

New Westinghouse Lightning Arrester Catalogue

A revision of its catalogue 1-A on Lightning Arresters has just been issued by the Westinghouse Electric and Manufacturing Company. After a brief treatment of lightning in general and ground connections, direct current lightning arresters are taken up. These are the familiar MP (multipath) arresters, and the newer K-3 condenser type arrester. Both of these are designed especially for street railway use. The K-3 arrester contains a spark gap in series with a condenser, of the flat plate unit form having a capacity of one microfarad. The electrolytic lightning arrester for car service is also described.

The line of AK electrolytic arresters now includes a type provided with sphere gap having horn extensions on the higher voltages, instead of horn gay only. There are a number of additions to the list of accessories and parts for these arresters.

Outline drawings with approximate dimensions of Type AK arresters in various settings complete the book, which is of much interest to electrical men having to do with transmission lines for power and railway purposes.

Mesco Catalogue

A wide range of electric fittings and appliances are listed in the Mesco catalogue recently issued by the Manhattan Electrical Supply Company for the convenience of customers. The book is 246 pages in length, printed on good paper and well illustrated, with flexible paper and cloth binding.

Pacific Power and Light Bulletin Discontinues

With the July issue the Bulletin, published by the Pacific Power & Light Company of Portland, Ore., discontinues its publication until after the war.

There are two reasons why this policy has been determined. First, it is considered essential that the company conserve revenue wherever possible as a measure of war economy, and this is one way to do it. Second, there is a constant change in organization personnel, which serves to weaken efficiency through shortage and inexperience, and necessitates the expenditure of effort only upon that which is absolutely necessary to the conduct of the company's operations.

Patriotic Bulletins

A patriotic booklet describing the origin of "Tanks" has been published by Colonel E. D. Swinton, C.B., D.S.O., through George H. Doran Co.

The report of the National Woman's Liberty Loan Committee for the first and second Liberty Loan Campaigns gives an account of the really fine service rendered by this organization.

A folder on war service issued by the Illuminating Engineering Society summarizes the society's endeavors to aid in the prosecution of the war.

The National Service Record of the employes of H. M. Byllesby and Co. and affiliated companies is published in an eight page booklet gotten out by that company.

"Power and Light," "In a New Light," "Power on the Farm" and "Running Water" are the titles of a series of 9 x 12 in. handsomely illustrated booklets on electricity on the farm prepared by the Western Electric Company for use in their farm light campaign. A further series of small folders accompanies these and leads up to them.

A pamphlet illustrating and describing the production and distribution of coke oven gas in the City of Toledo and the application of Thomas Meters for measuring large quantities of this gas is being gotten out by the Cutler-Hammer Manufacturing Company of Milwaukee.

Light for the Clothing Industry

The illuminating engineers of the Edison Lamp Works of the General Electric Company have prepared Bulletin No. 43410 containing the latest information as to the correct methods of lighting industrial plants, especially those devoted to the manufacture of clothing for our fighting forces at home and abroad. The bulletin is well illustrated, showing various lighting schemes most suitable for industrial purposes and the facts are brought out that to conserve the employes' health, to save coal, to increase the output and to keep the workers contented, it is necessary that a shop be well illuminated according to modern methods.

NEW ELECTRICAL DEVELOPMENTS

(The Seattle bond issue has at length been authorized by the capital issues committee. Several new power developments and extensions to old are planned throughout the West. In Los Angeles the municipal question is again to the fore. The use of electricity in conjunction with irrigation projects is becoming increasingly important in the Southwest and Intermountain region.—The Editor.)

THE PACIFIC NORTHWEST

WHITE ROCK, B. C.—Plans are being prepared for the installation of a municipal electric light plant, to cost about $40,000, in White Rock.

TACOMA, WASH.—The city of Tacoma, Wash., which recently adopted the seven cent car fare, is to have the matter tested in the courts.

SEATTLE, WASH.—The city council has authorized an indebtedness of $9500 to permit the double tracking of a portion of the municipal railway line.

SEATTLE, WASH.—The municipal lighting department has recently awarded the Burton L. Stare Company a contract for a 1000-kw. motor-generator set, at $24,780.

PORTLAND, ORE.—The Northwestern Electric Company is making preparations for construction of a wharf at its power station in South Portland to cost $12,000.

COURTENAY, B. C.—The Dyke Sawmill Company, it is reported, is planning to rebuild its mill, recently destroyed by fire. The cost of the new plant is estimated at $250,000.

REVELSTOKE, B. C.—The concrete dam at the municipal power plant was recently carried away owing to a rise in the Illecillewalt River. Repairs will be made immediately.

PORTLAND, ORE.—The Simes Company, 22 West 15th street, New York City, has been awarded a contract at $7694 for furnishing and installing lighting fixtures in the Portland post office.

PORTLAND, ORE.—Work has begun on the installation of the steam pipe line leading from the new plant of the Northwestern Electric Company to the heating system in the business section of the city.

SEATTLE, WASH.—The Electric Gun Company has been incorporated for $250,000 by R. L. Christensen, F. A. Andrews, C. E. Wineberg and others for the purpose of carrying on a manufacturing business.

TACOMA, WASH.—Manager Louis H. Bean of the Tacoma Railway & Power Company states that the company has already placed in service 34 additional cars since July 15, the time when the seven cent car fare went into effect.

VANCOUVER, B. C.—Mundy, Rowland & Company, electrical contractors, Standard Bank Building, Vancouver, have recently been awarded a contract by the Lyall Shiubuilding Company for electrical installations on six auxiliary schooners.

PORTLAND, ORE.—Work has been started on extensions to the car-manufacturing plant of Twohy Brothers of Portland in Montaville to provide for government orders for freight cars. About $150,000 will be expended in buildings and equipment.

MARSHFIELD, ORE.—Improvements are contemplated to the naval radio station at Englewood, near Marshfield, which will include the installation of a gas engine plant to furnish electricity in case of emergency. Two high-power gas engines, motors and two 1800-gal, tanks will be installed.

SEATTLE, WASH.—J. D. Ross, superintendent of the city lighting department, reparts that an additional steam-operated electrical unit will be constructed as soon as possible, with a capacity of 1000 kilowatts. The new unit will probably cost about $500,000 and will be paid for out of the utility bonds.

SEATTLE, WASH.—The city of Seattle has awarded the Westinghouse Electric & Manufacturing Company a contract for four 1000 kva. transformers and the General Electric Company a contract for a similar order. Transformers will be used in the main at the shipwards where the city is supplying considerable current.

VANCOUVER, WASH.—The contract for construction of a transformer station at the foot of Washington street has been awarded to Parker & Banfield, of Portland, Ore., at $5260. This station will be used as an auxiliary to supply electricity to operate the draw span of the bridge in case the present source of power should fail.

SEATTLE, WASH.—The Utilities Committee of the city has adopted a recommendation of the superintendent of public utilities for an interchange of transfers between the city street car line at 17th Avenue Northwest and the Greenwood line, owned by the Western Power Company. His recommendation for the purchase of 25 street cars was also adopted.

SEATTLE, WASH.—Puget Sound Traction Light and Power Company, Seattle, has received ten trailer cars for use in the shipyards district. They are designed to seat 66 people. Some more double and one-man cars have been shipped, being the first of fifteen that are coming. A new sub-station has been located in the University district to boost the voltage there.

CHELAN, WASH.—The Chelan Water Power Company has petitioned the Commissioners of Chelan county for a franchise to erect a pole transmission line from Entait to Maple Creek. This line will form part of the proposed new power system to be erected at Chelan, which will furnish electricity in Wenatchee and a large portion of the upper Columbia country in Chelan county.

SEATTLE, WASH.—Superintendent of Public Utilitics Thomas F. Murphine has sent a letter to the utilities committee of the city council recommending that a straight five cent fare instead of four cent tickets be charged on the municipal street railway. He estimates that this will increase the revenue about $50 a day and permit street car men to have 15-day vacations annually on full pay.

CAMP MEADE, WASH.—A contract has been awarded by the Cantonment Division, War Department, Washington, D. C., to Smith, Hauser & MacIsaacs, Inc., 18 East Firty-first street, New York, N. Y., for the construction of a training camp for Signal Corps, with accommodations for 11,000 men, to cost about $4,000,000. The plans include new barracks, extensions to hospitals, filtration plants, etc.

PORTLAND, ORE.—Rapid progress is being made on the construction of the new auxiliary power plant of the Northwestern Electric Company. The plant is located on a site adjoining the mill of the Portland Lumber Company in South Portland. Mill refuse from the lumber company's plant will be used for fuel. The generating capacity of the plant will be about 10,000 kw. and will cost about $2,000,000.

BREMERTON, WASH.—Bids will be received by the Bureau of Yards and Docks for furnishing and installing two surface condensers for a 3750 kva. turbo-generator, two motor-driven circulating pumps, one motor-driven flushing pump, auxiliary pumps for the condensers on foundations provided by the government at the Bremerton yard and at

Philadelphia. Specification No. 3085 covering the matter is to be had of the commandants of the yards.

SEATTLE, WASH.—The city has been authorized by the capital issues committee at Washington, D. C., to sell $5,500,000 in bonds for the construction of the 35,000 kw. hydro-electric plant planned on the Skagit river to serve war industries. This clears the way for immediate action as no vote is necessary for authorization of the bonds. The city is permitted to sell $1,500,000 in bonds this calendar year and $1,000,000 every six months thereafter until the entire amount is floated.

THE PACIFIC CENTRAL DISTRICT

FRESNO, CAL.—The California Associated Raisin Company of Fresno is contemplating the construction of a power plant, 85 ft. by 154 ft., at its works at Sun Maid City.

FRESNO, CAL.—The State Railroad Commission has granted the San Joaquin Light & Power Corporation of Fresno permission to operate in Kern county under a franchise granted by the county.

SAN FRANCISCO, CAL.—The Board of Public Works has awarded the contract for furnishing and delivering copper trolley wire for the Taraval street line, Municipal Railway System, to John A. Roeblings Sons at 38⅜ cents per pound.

SACRAMENTO, CAL.—Western States Gas & Electric Company has applied to the California Railroad Commission for authority to create an issue of $1,500,000 five-year 6½ per cent collateral notes, of which $690,000 are to be sold at not less than 94.

OROVILLE, CAL.—That the Pacific Gas & Electric Company is planning increasing its output of hydro-electric power in this district in the immediate future is the information contained in a letter written by John A. Britton, vice-president of the company, to the Oroville Chamber of Commerce.

MADERA, CAL.—The first unit of the new power project of the San Joaquin Light & Power Corporation on the Kings River will be completed in about one year. The power to be developed by the new system will approximate 100,000 kilowatts, the total capacity of the present power facilities amounting to about 55,000 kw.

SAN FRANCISCO, CAL.—A strong protest has been lodged by the North Beach Promotion Association with the Municipal Railway against the discontinuance of the Union and Stockton street line. A conference will be asked upon the matter if the reasons advanced for the re-establishment and improvement of the service are not effective.

PORTERVILLE, CAL.—The city council of Porterville plans the construction of a municipal electric power plant. F. W. Pease, city engineer, has prepared estimates showing that such a plant can be built and financed from the $12,000 which the city pays annually for its electric light service from the Mt. Whitney Power and Electric Company.

RICHMOND, CAL.—Among the new business secured by the Richmond division of the Western States Gas & Electric Company during the first week of July are the following power installations: 30 horsepower for the Los Angeles Pressed Brick Company, 10 horsepower for the Pacific Potash Products Company, and 15 horsepower for the Santa Fe Company.

PLACERVILLE, CAL.—Exhaustion of the water supply for any usage other than domestic purposes will come in the Placerville district very soon unless there is a decrease in the present consumption of water by irrigationists. This is according to a statement made here by H. R. Bennett, manager for the Placerville district of the Western States Gas & Electric Company.

WOODLAND, CAL.—According to announcement made here the Pacific Gas & Electric Company is to erect a substation at Knights Landing, Yolo county, to cost $250,000. The new plant will be used to connect up a line to Colusa, at which point connection will be made with the Northern California Company as part of the power pooling plan. The station will have a capacity of 8000 kilowatts.

REDDING, CAL.—The Northern California Power Company has commenced active construction of the fifty-six miles of power line that will connect its Coleman power plant with the Pacific Gas & Electrics system at Capay, six miles north of Hamilton City. This line will cost a quarter of a million dollars, and is to be completed by the last of October, if possible, to meet the order of the State Railroad Commission.

OAKLAND, CAL.—The Oakland council has refused to acknowledge receipt of a check for $10,681.56, signed by the Great Western Power Company, in payment of the company's franchise tax for the fiscal year ending June 30th last. The payment was referred to Mayor Davie and the City Attorney, pending the outcome of a suit brought by the city to collect $100,000, claimed to be due the city for franchise taxes.

SACRAMENTO, CAL.—About a score of linemen and wireworkers in the employ of the Pacific Gas & Electric Company at Sacramento benefit by the raise of 80 cents a day offered by that corporation and accepted by twenty San Francisco locals in a referendum vote. The increase will affect about 800 men in thirty counties, from San Mateo north. Electrical workers getting $5 a day are to get $5.80, and cable splicers getting $6 a day are to get $6.80.

SAN FRANCISCO, CAL.—Gradually the Pacific Gas & Electric Company, stimulated by the concession of more reasonable rates at the hands of the Railroad Commission, is working back to the strong statistical position which it occupied before our entry into the world-war began to raise the prices of all commodities, as well as of labor. The income account of this company for June reflects a gain of $42,698 in the month's balance available for dividends on the common stock, as compared with the corresponding figures for June, 1917.

OAKLAND, CAL.—Commissioner F. F. Jackson has presented to the Oakland City Council plans for cutting down the city's consumption of electric power for street lighting purposes one-half, commencing on August 1. Under the plan as outlined by Superintendent Carl E. Hardy of the electrical department following a conference with officials of the Pacific Gas & Electric Company, and H. G. Butler, federal administrator for this district, it is proposed to make the cut principally by reducing the size of the street lamps and in eliminating alternate lights where it can be done effectively.

OROVILLE, CAL.—A preliminary map of the proposed power development upon the Middle Fork of the Feather River has been completed by Paul Reicker. The plan is to construct a dam 650 feet in height at a point in the Bald Rock Canyon. It is stated that this dam can be constructed of granite which is abundant there. According to Reicker's figures, the dam will create a reservoir with a surface area of ten square miles, and will impound sufficient water for 2,000,000 acres. Accordingly, it is stated that the development of irrigation will equal in importance the projected power development.

THE PACIFIC SOUTHWEST

ORANGE, CAL.—J. P. Boring has sold his electrical supply shop to the J. G. Robertson Electrical Company, and has retired.

CLOVIS, N. M.—Bonds to the amount of $50,000 have been sold, the proceeds to be used for improvements to the municipal water and light plant.

WHITTIER, CAL.—It is stated by the district manager for the Southern Counties Gas Company that his company will build a 6000-ft. pipe line from a point near the McGinley wells at Montebello to the southeast as far as the Shell lease near Bartolo road.

RIVERSIDE, CAL.—Plans are being considered by the Nevada-California Power Company and the Southern Sierras Power Company, a subsidiary, to increase the output of their power plants, known as Nos. 2, 3, 4, 5 and 6, at Birch Creek, Inyo county, to cost approximately $85,000.

LOS ANGELES, CAL.—The Palmdale Irrigation District voted unanimously for officers who will carry through the construction of an irrigation system that will provide water for approximately 4400 acres of land in Antelope Valley. The system when complete will cost about $550,000.

LOS ANGELES, CAL.—The city council has granted the Southern Counties Gas Company a franchise to lay pipes and furnish natural gas to the industries and homes in Los Angeles Harbor District. It is a blanket franchise and the company will be required to give the best possible service.

SAN DIEGO, CAL.—An ordinance has been adopted by the Common Council granting to the Los Angeles and San Diego Beach Railroad Company the right, franchise and authority to operate and maintain its commercial steam railway, for a period of five years, with the privilege of using electricity as motive power.

SAN DIEGO, CAL.—The San Diego Consolidated Gas & Electric Company estimates its capital expenditures for the next two years at $731,100. Military and naval activities and general development of the country will necessitate enlargement of the plant and extension of facilities. The company has been authorized to issue $1,100,000 bonds.

NEWPORT BEACH, CAL.—The Newport Mesa district has voted to form an irrigation district. A well has already been sunk in the water-bearing sands of the Santa Ana river basin and assures the district plenty of water for all purposes. A pumping plant will be installed and a pipe line laid to a new reinforced concrete reservoir owned by the city of Newport Beach.

SAN DIEGO, CAL.—With the expenditure of $16,000 the city may soon be able to pump 5,000,000 gallons of water daily from the San Diego river in Mission Valley. In the near future the council may decide to appropriate the money necessary for this work. Pumps are already on the ground, and the only expense necessary would be for pipes to connect wells with the city's mains.

SAN DIEGO, CAL.—City Engineer George Cromwell has filed his estimate of the cost of the proposed retarding dam in Powder House canyon to prevent the overflow of the diverting dam in Switzer Canyon, with the City Council, placing the cost at $14,965. The plans call for an earth dam 27 feet high with a concrete face. The dam would impound 38,850,000 gallons of water.

SANTA MONICA, CAL.—A letter has been received stating that the Pacific Electric Railway Company will finish lowering the track and grading on Ocean Boulevard between Montana Avenue and Santa Monica Boulevard, paving the space between the tracks with rock and oil; also that the company has no present intention of extending its line down San Vicente Boulevard, down 11th street to Montana.

LOS ANGELES, CAL.—The city council has granted the Pacific Electric Railway Company a permit to construct a single railroad curved track connecting its Ionia Avenue-Hawthorne line and the line extending from Delta Avenue to San Pedro by way of Gardena, across the valley between 116th street and 117th street, and over the easterly 20 feet of Vermont Avenue between 116th street and 117th street.

LOMPOC, CAL.—The Lompoc Light and Power Company, which supplies electricity to consumers in Lompoc, Los Angeles county, filed an application with the Commission for authority either to increase its rates or close its plant for use between 11 o'clock at night and the time lights are required for the following evening. High cost of labor, oil and material, the company says, makes the application necessary.

LOS ANGELES, CAL.—An important step in the city's program for development of additional hydro-electric power and fuel conservation was taken the other day when the commission referred to the committee of the whole the recommendation of Engineer Scattergood that the board make financial arrangements for constructing power plant No. 2 as soon as possible. It is estimated that this plant will cost $1,400,000 and will have a capacity of 28,000 h.p.

ONTARIO, CAL.—The State Railroad Commission has granted the Ontario Power Company permission to build a hydro-electric power plant in San Antonio Canyon, taking water from San Antonio Creek. The Southern California Edison Company will contract to take all energy generated which is not absorbed by the Ontario Power Company during the first five years of the contract. After five years the Edison Company will take all the energy. The cost of the plant is estimated at $64,551.

LOS ANGELES, CAL.—Mayor Woodman and Prof. Robertson of the Public Service Commission held a conference a few days ago on the city's plans for additional development of hydro-electric power and conservation of fuel oil and gas. The Public Service department contemplates purchasing the water rights of Big Pine Creek, in Owens River Valley, to develop additional power. At that plant it is proposed to establish a big reservoir, cement conduits and three municipal power plants, each having a capacity of 5000 h.p.

GLENDALE, ARIZ.—More than 40 electrically driven pumping plants are to be purchased and erected by the Salt River Valley Water Users' Association. These pumping plants are to be installed upon wells that will be fed by the seepage water from the canal that is fed by the large reservoir created by the Roosevelt dam. Electricity to operate the pumps will be supplied by the hydro-electric plant of the Salt River Valley Water Users' Association at the Roosevelt dam. The cost of the proposed work is estimated at about $500,000.

THE INTER-MOUNTAIN DISTRICT

CLIMAX, COLO.—Climax Molybdenum Company is planning for the installation of a new electric-haulage system in its new White tunnel at its properties.

BUTTE, MONT.—Butte was placed in darkness a few nights ago as a result of a fire at the principal sub-station of the Montana Power Company.

BALLANTINE, MONT.—Construction work on the Huntley Irrigation Project was confined to building of the Ballantine auxiliary pumping plant, supplemental construction, and repairs.

MASON, NEV.—In connection with the proposed construction of a 400-ton flotation mill at the properties of the Dominion Reduction Company, considerable electric equipment will be required.

POPLAR, MONT.—The local power company contemplates the installation of another engine unit at the city pumping station to furnish an all-night electric lighting service for the city.

MELCHER, IDAHO.—The Melcher transmission line of the Minidolca Project, U. S. Reclamation Service, has been completed except for placing side guys. The Melcher substation has been painted and installation finished except for drying out transformers. The Paul substation has been plastered and partly painted, and the installation of electrical apparatus begun.

STRAWBERRY VALLEY, UTAH.—Forms of 10-year contracts have been submitted to the towns of Payson, Salem, Spanish Fork, and Springville for furnishing them with power from the Reclamation Service power plant at a rate considerably in advance over the present rates. These were submitted in answer to requests made in resolutions submitted by the towns regarding the lease of the power plant.